

# Syllabus for ENGR 1120 – Engineering Graphics and Design

## University of Georgia – College of Engineering

### Fall Semester 2021

#### Overview of Course

Instructor	Email	Office	Virtual Office Hours
Adam Wineland	<a href="mailto:adwine@uga.edu">adwine@uga.edu</a>	Driftmier Engineering Center	By Appointment

Semesters Offered	Credits	Course Level	Delivery Method
Fall, Spring, Summer	2	Undergraduate	Flipped Classroom All instructional material is available asynchronously on eLC.

Course Pre- or Co-requisites:

MATH 1113 or MATH 1113E – Pre-Calculus AND

ENVE 1010 – Synthesis and Design (First Year Seminar) OR

ENGR 1920 – Introduction to Engineering

ENGR 1120 focuses on instruction in communicating engineering designs and ideas using modern graphics tools and software. The primary objectives of the course are:

1. Develop fundamental skills pertaining to spatial visualization, neatness, clarity, and attention to detail.
2. Understand how to interpret various types of engineering drawings.
3. Develop 2-D and 3-D graphics communication skills using hand-drawn sketches and CAD software.
4. Understand the use of working drawings in the communication of engineering designs and develop a set of them.

#### Required Supplies and Technology

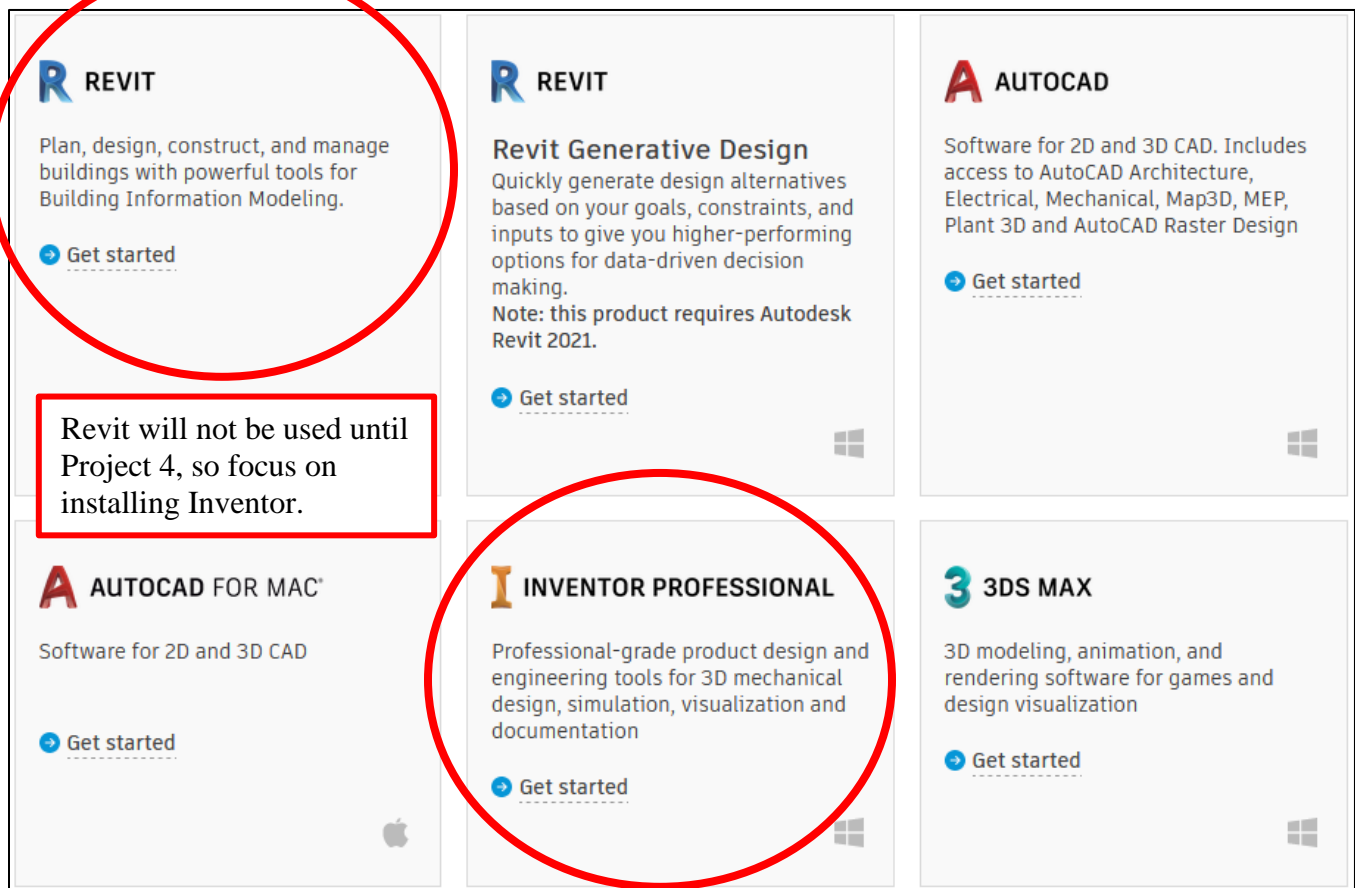
- Required Textbook: Engineering Design Graphics, 2nd Edition, James Leake and Jacob Borgerson. ISBN 978-1-118-07888-4: [https://www.amazon.com/s?k=9781118078884&ref=nb\\_sb\\_noss](https://www.amazon.com/s?k=9781118078884&ref=nb_sb_noss)
- Architect's Scale: [https://www.amazon.com/s?k=architect+scale&ref=nb\\_sb\\_noss\\_2](https://www.amazon.com/s?k=architect+scale&ref=nb_sb_noss_2)
- Engineer's Scale: [https://www.amazon.com/s?k=engineering+scale&ref=nb\\_sb\\_noss\\_2](https://www.amazon.com/s?k=engineering+scale&ref=nb_sb_noss_2)
- Ruler with Imperial and Metric Markings: [https://www.amazon.com/s?k=ruler&ref=nb\\_sb\\_noss\\_2](https://www.amazon.com/s?k=ruler&ref=nb_sb_noss_2)
- Digital Vernier Caliper: [https://www.amazon.com/s?k=vernier+caliper&ref=nb\\_sb\\_noss\\_2](https://www.amazon.com/s?k=vernier+caliper&ref=nb_sb_noss_2)
- Square Grid Paper: [https://www.amazon.com/s?k=square+grid+paper&ref=nb\\_sb\\_noss\\_2](https://www.amazon.com/s?k=square+grid+paper&ref=nb_sb_noss_2)
- Isometric Grid Paper: [https://www.amazon.com/s?k=isometric+grid+paper&ref=nb\\_sb\\_noss\\_2](https://www.amazon.com/s?k=isometric+grid+paper&ref=nb_sb_noss_2)
- Computer capable of running
  - Autodesk Inventor Professional 2019 (or newer) AND Revit 2019 (or newer)
  - OR
  - The college's MyLAB
- Reliable high speed internet connectivity
- Webcam with microphone
- Printer
- Scanner (or camera)

### Access to Software Outside of the Classroom (Both are Free for Students)

Driftmier's computers have Inventor and Revit. Driftmier is open 24/7 to students (bring your school ID). However, it is strongly recommended that you install Inventor and Revit on your own computer. Here are your options for accessing Inventor and Revit outside of the classroom:

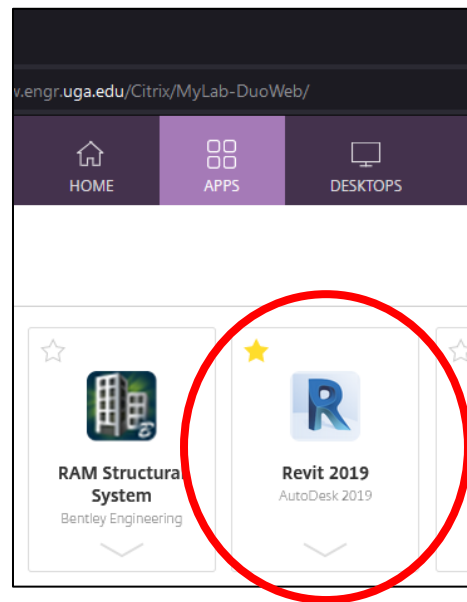
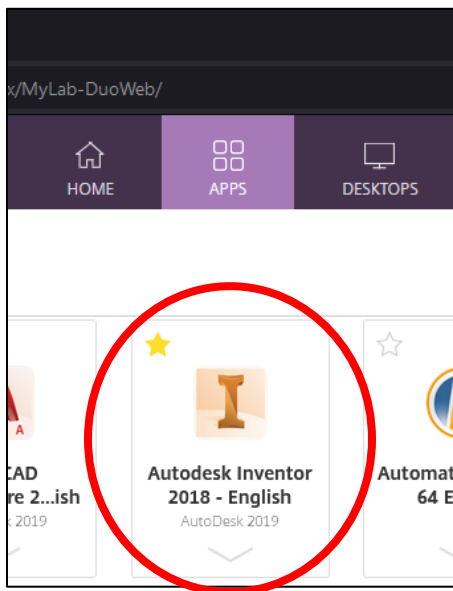
**Option 1:** Install Inventor Professional 2022 and Revit 2022 on your own computer:

- <https://www.autodesk.com/education/edu-software/overview?sorting=featured&page=1>
- Use your UGA email to make a new account. Then download the program by clicking "Get started" on the program's tile.
- Inventor and Revit are not available for Mac, so Mac users must use MyLAB or Driftmier's computers
- If you are having trouble installing software on your computer, contact **enr-support@uga.edu**.



**Option 2:** Use MyLAB (the College of Engineering's Virtual Computer Lab):

- <https://mylab.engr.uga.edu>
- Use your UGA MyID to access MyLAB.
- Inventor is mislabeled as 2018 in MyLAB, but the link opens 2019.
- If you are having trouble accessing MyLAB, contact **enr-support@uga.edu**.

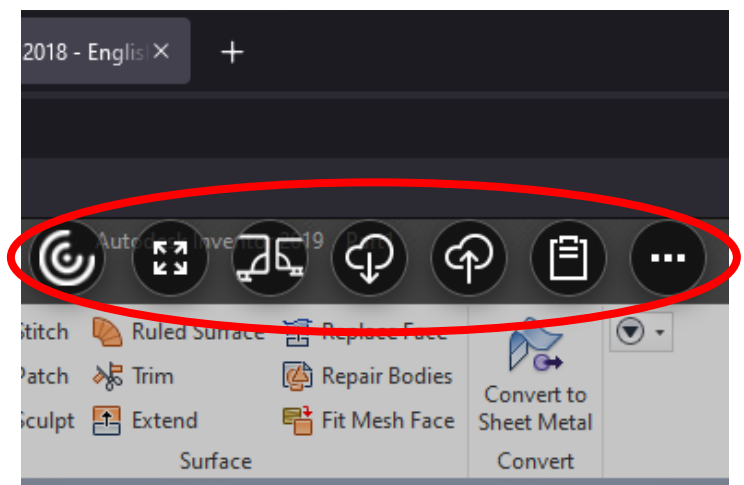
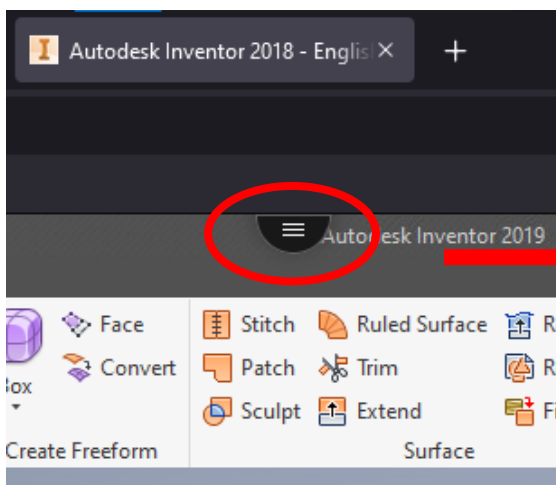


### MyLAB Compatibility Issues

MyLAB uses Inventor 2019 and Revit 2019. I will be using Inventor 2022 and Revit 2022, but I will provide files that are compatible with 2019 and newer versions. Older versions of Inventor and Revit are not able to open files saved by newer versions. For example, Inventor 2019 cannot open a file saved by Inventor 2022. Therefore, be consistent, and use a single version of Inventor and Revit.

### MyLAB File Transfer

MyLAB users can transfer files to and from their computer by using the overlay menu at the top of the screen. MyLAB users must save files to their Z: drive from within MyLAB or download the files from MyLAB onto their computer or else all work will be lost.



### **eLearning Commons (eLC) and UGAMail (Email) Requirement**

Both eLC (<https://elc.uga.edu>) and UGAMail (<https://ugamail.uga.edu/>) will be used to give assignments, make announcements, and communicate with students. *Students are required check eLC and UGAMail daily.*

### **Engineering Professionalism Policy**

The engineering profession is governed by a code of ethics. The following link will take you to the National Society of Professional Engineers, Engineering Code of Ethics website:

<https://www.nspe.org/resources/ethics/code-ethics>. Engineering faculty at UGA expect students to act in a professional manner at all times and develop the work ethic required for a successful engineering career. Engineering students at UGA are responsible for maintaining the highest standards of professionalism and professional practice.

### **Academic Honesty**

Students are permitted to collaborate by sharing knowledge. However, students are not allowed to share, distribute, or obtain drawings, models, or files from each other or other sources. You must do your own work.

UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at <https://www.uga.edu/ovpi>.

The University of Georgia seeks to promote and ensure academic honesty and personal integrity among students and other members of the University Community. All academic work must meet the standards contained in "A Culture of Honesty." Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Students are responsible for informing themselves about these standards before performing any academic work. Questions related to course assignments and the academic honesty policy should be directed to the instructor. The link to more detailed information about academic honesty can be found at: <https://honesty.uga.edu/>.

### **Meetings with Instructors or Peer Helpers**

Out of the classroom meetings with any instructor or peer helper can be arranged as needed. In order to develop professional skills, it is preferred that students contact the instructor or peer helper in person or by email to set a date and time for the meeting. If you make an appointment and must cancel, it is expected that you contact the instructor or peer helper in a reasonable amount of time.

### **Free Tutoring**

The Division of Academic Enhancement (DAE) offers free peer tutoring in over 100 of UGA's most rigorous courses including writing tutoring. To engage with a tutor, download the Penji app, available on iOS and Android, and create an account using your MyID@uga.edu email address. Don't have a smart phone? Navigate to <https://web.penjiapp.com> and create an account using your MyID@uga.edu email address. Need help? Visit our website (<https://dae.uga.edu/services/tutoring/>) for more information on how to engage with a tutor or email us at [tutor@uga.edu](mailto:tutor@uga.edu). In addition to peer tutoring, the DAE also provides Academic Coaching, Student Success Workshops and more. The DAE is committed to the success of all students at the University of Georgia. For more on these and other resources, please visit <https://dae.uga.edu>.

## **Mental Health and Wellness Resources**

1. If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit <https://sco.uga.edu>. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.
2. UGA has several resources for a student seeking mental health services (<https://www.uhs.uga.edu/bewelluga/bewelluga>) or crisis support (<https://www.uhs.uga.edu/info/emergencies>).
3. If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (<https://www.uhs.uga.edu/bewelluga/bewelluga>) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.
4. Additional resources can be accessed through the UGA App.

## **Grade Determination**

The final grade for the course is calculated using the following distribution:

- **Project 1 (Progress Checks + Final Drawings + Quiz 1):** **100 Points**
  - 10 Progress Checks: 5 Points Each
  - Final Drawings: 40 Points
  - Quiz 1: 10 Points
- **Project 2 (Progress Checks + Final Drawings + Quiz 2):** **100 Points**
  - 4 Progress Checks: 10 Points Each
  - Final Drawings: 50 Points
  - Quiz 2: 10 Points
- **Project 3 (Progress Checks + Final Drawings + Quiz 3):** **100 Points**
  - 3 Progress Checks: 10 Points
  - Final Drawings: 60 Points
  - Quiz 3: 10 Points
- **Project 4 (Progress Checks + Final Drawings + Quiz 4):** **100 Points**
  - 3 Progress Checks: 10 Points Each
  - Final Drawings: 60 Points
  - Quiz 4: 10 Points

A (4.0 GPA) = 93 and above (372 points and above)	C+ (2.3 GPA) = 77-79.9 (308 – 319.6 points)
A- (3.7 GPA) = 90-92.9 (360 – 371.6 points)	C (2.0 GPA) = 73-76.9 (292 – 307.6 points)
B+ (3.3 GPA) = 87-89.9 (348 – 359.6 points)	C- (1.7 GPA) = 70-72.9 (280– 291.6 points)
B (3.0 GPA) = 83-86.9 (332 – 347.6 points)	D (1.0 GPA) = 60-69.9 (240 – 279.6 points)
B- (2.7 GPA) = 80-82.9 (320 – 331.6 points)	F (0 GPA) = Below 60 (Below 240 points)

1. A shows maximum effort and high level of skills for a first-year engineering student.
2. B shows very high level of effort and above average skills for a first-year engineering student .
3. C shows a good effort and average skills for a first-year engineering student.
4. D shows below average effort and below average skills for a first-year engineering student.
5. F shows unacceptable work.

### **Extra Credit for Early Submissions**

Final Drawings submitted at least two days early will receive five extra points. Resubmissions of projects at a later date will negate the extra credit. I.e., resubmissions must also be submitted at least two days early. For example, if an assignment is due on a Friday at 11 PM, the assignment (or resubmission) must be turned in before Wednesday at 11 PM.

### **Late Policy**

No missed or late progress checks, quizzes, exams, projects, or other assignments will be accepted without a valid excuse. A student may be withdrawn from the course by the instructor without notification if excessive missed or late assignments (excused or unexcused) are incurred. For this course, “excessive missed or late assignments” is defined as missing five assignments.

## **Coursework**

### **Supplemental Reading and Instructional Videos**

Readings from the textbook and instructional videos will be assigned periodically to introduce subjects crucial to the course. Students are expected to read assigned material, watch assigned videos, and practice the techniques in the videos before the topics are formally introduced.

### **Progress Checks**

Progress checks ensure that students are completing their work at a steady pace. Progress checks are mandatory. Progress checks are pass/fail. However, a pseudo grade will be assigned to reflect the quality of the work simply as a way for the student to determine how well he/she understands the material. These pseudo grades do not count toward the student's final grade. So long as substantial work is turned in for a progress check, the student receives 100% (pass) credit for the assignment. A pseudo grade greater than F is considered substantial work. A pseudo grade of F is not considered substantial work, resulting in an actual grade of zero (fail) for the assignment. Unexcused missed progress checks result in a zero (fail) for the assignment. Progress checks turned in after the due date will not be accepted without a valid excuse.

### **Project 1**

Project 1 introduces students to orthographic, isometric, and multiview projections; visualization techniques; basic solid modeling; dimensioning guidelines and tolerancing; and use of scaling rulers. A collection of problems will be assigned on the project announcement date. Final drawings turned in after the due date will not be accepted without a valid excuse.

### **Project 2**

Project 2 introduces students to mechanical working drawings and assesses their ability to create and annotate a set of working drawings. A collection of problems will be assigned on the project announcement date. Final drawings turned in after the due date will not be accepted without a valid excuse.

### **Project 3**

Project 3 introduces students to the engineering design process and basic reverse engineering skills. Project 3 assesses each student's ability to dissect a device, digitally model its components, and create a set of working drawings from the models. Further instructions will be given on the project announcement date. Final drawings turned in after the due date will not be accepted without a valid excuse.

### **Project 4**

Project 4 introduces students to architectural drawings and assesses their ability to create and annotate architectural layouts. A collection of problems will be assigned on the project announcement date. Final drawings turned in after the due date will not be accepted without a valid excuse.

### **End of Project Quizzes**

Quizzes cover conceptual material, drafting standards, definitions, and information relevant to the latest project and may include questions relevant to previous projects. Quizzes are given on the due dates of projects. Many quiz questions come directly from reading assignments, lecture slides, and videos. Quizzes completed after the due date will not be accepted without a valid excuse.

### **Final Exam**

There is no final exam.

**Time Commitments**

Students are expected to dedicate approximately eight hours per week to ENGR 1120. I highly suggest students dedicate 1-2 hours every day toward studying and completing assignments.

**Virtual Help Sessions**

All instructional material required to complete assignments is available asynchronously on eLC. However, students may set up appointments via email for virtual help sessions. In your email to the instructor, indicate days and times you are available. Zoom will be used as the primary software for help sessions. Zoom meeting information and links will be emailed to the student before the appointment time.



## Schedule and Outline

Updates or changes to the schedule will be announced to the class by the instructor.

We meet in person on Mondays and Wednesdays. We do not meet on Fridays, but assignments may be due.

Week	Day	Date	Topic
1	Wednesday	August 18	Introduction to ENGR 1120 Warm-Up Problems
	Friday	August 20	Progress Check 1 Due
2	Monday	August 23	Begin Project 1: Orthographic, Isometric, Multiview Projections, and Basic Solid Modeling
	Wednesday	August 25	
	Friday	August 27	Progress Check 2 Due
3	Monday	August 30	Progress Check 3 Due
	Wednesday	September 1	
	Friday	September 3	Progress Check 4 Due
4	Monday	September 6	Labor Day (No Class)
	Wednesday	September 8	
	Friday	September 10	Progress Check 5 Due
5	Monday	September 13	Progress Check 6 Due
	Wednesday	September 15	
	Friday	September 17	Progress Check 7 Due
6	Monday	September 20	Progress Check 8 Due
	Wednesday	September 22	
	Friday	September 24	Progress Check 9 Due
7	Monday	September 27	Progress Check 10 Due
	Wednesday	September 29	
	<b>Friday</b>	<b>October 1</b>	<b>Project 1 Final Drawings Due</b> <b>Quiz 1 Due</b>
8	Monday	October 4	Begin Project 2: Working Drawings
	Wednesday	October 6	
	Friday	October 8	Progress Check 11 Due
9	Monday	October 11	Progress Check 12 Due
	Wednesday	October 13	
	Friday	October 15	Progress Check 13 Due

10	Monday	October 18	Progress Check 14 Due
	Wednesday	October 20	
	<b>Friday</b>	<b>October 22</b>	<b>Project 2 Final Drawings Due Quiz 2 Due</b>
11	Monday	October 25	Begin Project 3: Engineering Design and Reverse Engineering
	<b>Wednesday</b>	<b>October 27</b>	<b>Device Approval Due</b>
	Friday	October 29	Fall Break (No Class)
12	Monday	November 1	Progress Check 15 Due
	Wednesday	November 3	
	Friday	November 5	Progress Check 16 Due
13	Monday	November 8	Progress Check 17 Due
	Wednesday	November 10	
	<b>Friday</b>	<b>November 12</b>	<b>Project 3 Final Drawings Due Quiz 3 Due</b>
14	Monday	November 15	Begin Project 4: Architectural Layouts
	Wednesday	November 17	
	Friday	November 19	Progress Check 18 Due
15	Monday	November 22	
	Wednesday	November 24	Thanksgiving (No Class)
	Friday	November 26	Thanksgiving (No Class)
16	Monday	November 29	Progress Check 19 Due
	Wednesday	December 1	
	Friday	December 3	Progress Check 20 Due
17	Monday	December 6	
	<b>TUESDAY (Friday Schedule)</b>	<b>December 7</b>	<b>Project 4 Final Drawings Due Quiz 4 Due</b>

## **High Demand Major Requirements for the College of Engineering**

### **Selection Criteria**

Applicants to the high demand majors will be selected based on their grades in general education and major specific courses along with information submitted in the application and statement of purpose detailing their interest in the major along with relevant experiences and future career goals. Students may indicate their first, second and third choices for their engineering major, although listing a second or third alternate besides their primary selection is not required.

Selection of applicants is based on a review of student scores and achievements in the following **three** areas:

- General Education Coursework (30%)
- Major Specific Coursework (40%)
- Personal Statement of Purpose (30%)

### **General Education Coursework**

General Education Coursework applies to all degree programs. Students must complete the following courses with a grade of "C" (2.0) or better:

- MATH 2250: *Calculus I for Science and Engineering*
- MATH 2260: *Calculus II for Science and Engineering*
- PHYS 1211: *Principles of Physics for Scientists and Engineers - Mechanics, Waves, Thermodynamics -*  
OR - PHYS 1251: *Introductory Studio Physics for Engineers I*
- ENGL 1101: *English Composition I*

### **Major Specific Coursework**

To be considered as a candidate for **Agricultural Engineering, Civil Engineering, Environmental Engineering or Mechanical Engineering**, students must complete the following courses:

- **ENGR 1120: *Engineering Graphics and Design***
- ENGR 1140: *Computational Engineering Methods*
- ENGR 2120: *Engineering Statics*

To be considered as a candidate for **Biological Engineering or Biochemical Engineering**, students must complete the following courses:

- BIOL 1107 & BIOL 1107L: *Principles of Biology I*
- CHEM 1212 & CHEM 1212L: *Principles of Chemistry II*
- ENGR 2120: *Engineering Statics*

### **Personal Statement of Purpose**

In no more than two pages, provide your personal statement of purpose:

- Explain your interest in engineering and describe your experience with engineering.
- What is your ultimate career aspiration?
- How will your chosen College of Engineering majors enable you to reach your career goals?

***The above criteria are minimum application requirements and do not guarantee acceptance to any major in the College of Engineering.***

The following links provide more information on the high demand major application and admission processes:

<https://engineering.uga.edu/academics/admissions-eligibility>

<https://engineering.uga.edu/academics/admissions-process>

### **UGA College of Engineering Accreditation**

The programs in the UGA College of Engineering are accredited through ABET, a nonprofit, non-governmental organization that accredits college and university programs in the disciplines of applied science, computing, engineering, and engineering technology. ABET accredits over 3,100 programs at more than 670 colleges and universities in 24 countries. \*

Earning a degree from an ABET-accredited program:\*

- Verifies that the quality of the educational experience you've received meets the standards of the profession.
- Increases and enhances employment opportunities.
- Permits and eases entry to a technical profession through licensure, registration, and certification.
- Establishes eligibility for many federal student loans, grants, and/or scholarships.

An ABET-accredited program assures students that:\*

- the institution is committed to improving their educational experience
- the program is committed to using best practices and innovation in education
- the program is guided by its industry, government, and academic constituents through formal feedback
- the program considers the students' perspective as part of its continuous quality improvement process

See more at <https://abet.org/why-accreditation-matters/>

\*from abet.org

**From time to time you will likely be asked for your assessment of UGA's Engineering Programs as part of the accreditation process. Your responses are much appreciated!**

## **ABET Student Outcomes Assessment Matrix**

<b>Student Outcomes</b>	<b>Assessment Criteria</b>	<b>Assessment Method</b>
<b>1.</b> an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Visualize and construct 2-dimensional drawings to scale	Progress Checks Projects Quizzes
	Visualize and draw in 3-dimensional space	
<b>3.</b> an ability to communicate effectively with a range of audiences	Construct and determine appropriate view selections for multiview orthographic projections	
	Link the engineering design process, written communication, and computer based graphic design	
	Read, interpret, and develop architectural layouts and mechanical working drawings	
	Use standards and conventions in generating engineering drawings	
<b>7.</b> an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Use standards and conventions in generating engineering drawings and layouts	
	Generate 2-d orthographic projections from 3-d solids	
	Read, interpret, and develop schematic drawings	
	Read, interpret, and develop working drawings	
	Link the engineering design process, written communication, and computer based graphic design	

### **Revision**

August 2021

This course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.