Ironwood Ridge High School



**PLTW – House of the Nighthawks**



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1. **Course Name: Introduction to Engineering Design**

**Instructor:** Mrs. Carmen Shugert

1. **Teacher Biography.**

I hold a BS in Civil Engineering, and worked for three years in the industry as a contractor for Ford Motor Co. I have also a Master Degree in Curriculum Development and Instruction from NAU. I am certified to teach secondary mathematics, PLTW curriculum in Introduction to Engineering Design, Principles of Engineering, and Digital Electronics. I have been teaching mathematics since 2004 at Chandler High School in the Chandler district. I started the engineering program at CHS in 2013, and was teaching three levels of honors engineering courses before moving to Tucson. I am fortunate to say that teaching is my passion and I enjoy being around my students.

1. **Teacher Contacts:**

Office: Room A318

Office Hours: M-F by appointment from 7:30-8:00 AM & 3:35-4:00 PM

Email: cshugert@amphi.com (preferred form of communication)

Webpage: <https://www.amphi.com/domain/4835>

Phone: 520-407-4213

1. **Course Description.**

Introduction to Engineering Design (IED) is a high school level course that is appropriate for students who are interested in design and engineering. The major focus of the IED course is to expose students to design process, research and analysis, teamwork, communication methods, global and human impacts, engineering standards, and technical documentation

Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use the most current issued 3D solid modeling design software package to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work, and communicate their solutions to their peers and members of the professional community.

1. **Overview.**

The following is a tentative outline for the IED Course content by Unit.

Unit 1: Design Process

Unit 2: Technical Sketching and Drawing

Unit 3: Measurement and Statistics

Unit 4: Modeling Skills

Unit 5: Geometry of Design

Unit 6: Reverse Engineering

Unit 7: Documentation

Unit 8: Advanced Computer Modeling

Unit 9: Design Team

Unit 10: Design Challenges

Unit 11. Robotics – Building & Programming

**NOTE:** Document Storage Suggestions:  Google Drive @student.amphi.com account

1. **Course Objectives/Standards:**

<https://www.azed.gov/cte/es/>

1. **Portrait of a Graduate:**

 Upon successful completion of this course, the student will be able to demonstrate:

1. The skills to continually develop good study and time management habits.
2. Experience with the interdisciplinary aspect of engineering.
3. Technical written and oral communication skills.
4. Knowledge of engineering ethics and professionalism.
5. Knowledge and experience with the design process through critical & creative thinking, problem solving, evaluation, and reflection of project outcomes, etc.
6. Assess and develop their teamwork skills.
7. **Required Books and Materials.**
* Engineering Notebook (provided)
1. **Optional Books and Materials.**

Scientific calculator, black/blue pen, pencils, erasers, highlighters, graph paper.

1. **Attendance Policy.** (See Addendum)
* Absences: Caregivers are required to report student absence in order to be excused.
* Late Work: Only students who have made previous arrangements with the teacher are able to turn late work for full credit.
* Make-up Work: Only students with Excused Absences will be allowed to make up work without grade penalty.
* Students have as many days as they were absent to complete and turn in all make-up work.
* Students with non-excused absences will receive no credit.
1. **Tardy Policy.** (See Addendum)
* Students arriving to campus more than 7 minutes late for the start of the school day should report to the Attendance Office.
* When a student arrives more than 7 minutes late to class without a note from the Attendance Office, will be sent immediately to the Attendance Office.
1. **Course Grading and Examinations.** Course grades are based on the following:

**Component: Percent of Course: May Include:**

Projects 40% Any type of assessment

Professionalism 20% Attendance, engagement, citizenship

Class Assignments 20% Engineering notebook content

**Final Exam (FE) 20%**

Total……………………… 100%

**Important:** The scores for the projects may contain a significant component for individual participation and effort, and how you interact with your team and your contributions to the team effort. You will receive a letter grade for the course assigned as follow:

90% ≤ A

Sample Grade Calculation **after** taking the FE:

Category Grade Calc, Pts.

Projects 85 → 85x0.4 = 34.0

Prof 93 → 93x0.2 = 18.6

C.A. 89 → 89x0.2 = 17.8

FE 81 → 81x0.2 = 16.2

 Total Pts. 86.6

Cum. Grade Calc. w/o FE:

(86.6 ÷ **100**)x100 = 86.6%

Sample Grade Calculation **before** taking the FE:

Category Grade Calc, Pts.

Projects 85 → 85x0.4 = 34.0

Prof 93 → 93x0.2 = 18.6

C.A. 89 → 89x0.2 = 17.8

 Total Pts. 70.4

Cum. Grade Calc. w/o FE:

(70.4 ÷ **80**)x100 = 88%

 80% ≤ B < 90%

 70% ≤ C < 80%

 60% ≤ D < 70%

 F < 60%

1. **Cheating.**

When cheating occurs, the teacher will follow district guidelines.

1. **Conference Period.**

Will define when we are back in the classroom.

1. **Class Guidelines.** (See Addendum for additional class guidelines)

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (i.e. texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may write an administrative referral.

* + - Classroom Guidelines:
* Food and drinks are NOT ALLOWED in my classroom. Bottled water is acceptable (but never near computers/equipment)
* Cell phones will be collected at the beginning of class and returned on your way out.
* Foul language/Bulling will not be permitted in class***.***
* Computer/3D Printer misuse may result in loss of privileges to use a computer in class. This includes:
* Unauthorized internet sites
* Tampering with other students work in share file folders
* Creating non-authorized file folders (i.e. games) containing files that are not related to our class.

**Consequences.** If a student chooses to break a rule:

* + Notify Parent: Student will contact parent/guardian to explain unacceptable behavior and assigned consequences.
	+ Referral: A referral will be written and given to the administrator for appropriate action to be taken.

NOTE: Before using any of the equipment in the Shop, students MUST complete safety training. We have several large power tools in the workshop. Students should not wear open toed shoes, or loose clothing when working with the equipment. Long hair should be tied back.

**\* Addendum (Online by Necessity):**

1. *Engaging in Online Classes:*

To help prepare students for the start of the school year, we are providing the following information to help familiarize students with the routines teachers will be following:

Students should expect to engage their teachers in the Zoom environment with their webcam activated. If your student is not able to use a webcam, please email the teacher and let them know the circumstances.

* To be admitted into Zoom classrooms, students must have a neutral background, an appropriate environment, be appropriately dressed and ready to learn. Students who are in pajamas, laying in their bed or use an inappropriate background will be exited from the classroom and marked absent.
* Teachers will communicate information and/or email students using students’ Amphi Gmail accounts. Student’s Amphi Gmail accounts use the following format: Student\_ID\_Number@student.amphi.com (Ex. 30012345@student.amphi.com)
* When using Zoom, students will need to use their first initial, last name to identify themselves to the teacher.
* Students need to follow proper etiquette in both the Zoom and Google Classroom environments, refraining from inappropriate language or off topic discussions.
1. *Attendance:*
* Teachers will take attendance at the beginning of the class period; thus, it is important to enter class on time.
* Students joining class after 7 minutes will be marked Tardy.
* Students who exit the class session without being excused by a caregiver will be marked absent
* Caregivers are required to report student absence in order to be excused
* Only students with Excused absences will be allowed to make up work without grade penalty.
1. *Grades:*

In light of the profound implications of COVID-19 on students’ academic learning and social-emotional well-being, Amphitheater School District’s Secondary Schools have adopted the following principles and protocols for grading and assessment for the 2020 – 2021 school year.

* Students are expected to complete and submit assignments by the stated/written due date. Students can submit work up to a week late with no penalty. Individual student challenges should be considered before assigning a grade
* The minimum grade that can be assigned to a student on any given assignment is a 50%. Students who are on track to State and course standards mastery, show effort, and meet deadlines can expect a grade higher than 50%.

 **Ironwood Ridge High School**



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CONTRACT FOR SUCCESS

Introduction to Engineering Design - IED

Mrs. Shugert

**The Student:**

* I understand that **good attendance** is vital to my success and that **being on time** is a sign of maturity and shows that I value myself and my education.
* I promise to **respect myself, my peers, and the IRHS staff**.
* I promise to **respect school property, the property of classmates, and all items in the classroom, and all class guidelines described on Part 15.**
* I promise to behave in class, **showing respect for myself and others** by acting in a mature and responsible manner. I understand that my behavior reflects on my family, my community, my culture and myself.
* I promise to **work to the best of my ability**, always keeping in mind that the skills I learn are life-long values.
* I have read and understand the rules and procedures for IED course.

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Student Signature Print Name

**The Parent/Guardian:**

* I will set high expectations for my son/daughter.
* I will help my son/daughter live up to the above contract.
* I will work with the teacher and feel free to contact her if I have concerns about my son/daughter’s progress.
* I have read and understand the rules and procedures my child will be expected to follow for the IED course.
* My son/daughter owns and bring to school a cell phone \_\_\_\_Yes \_\_\_\_No

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Parent/Guardian Signature Print Name

Parent/Guardian’s Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent/Guardian’s Email: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_