James Clemens High School
11306 County Line Road
Madison, AL 35756

Phone: 256-216-5313
Extension: 95119
Email: aeepperson@madisoncity.k12.al.us

Course Syllabus

Career Pathway Project in STEM: Engineering Research and Design- Spring 2023
Instructor: Ms. Allison Epperson

Dear Parent/Guardian,

Welcome to Engineering Research and Design!

My name is Allison Epperson and I will be your student's RnD teacher this semester. It is my second year at JC, and I am so happy to be organizing JC's RnD program! In this class, students are placed at companies where they intern daily in 3rd and 4th block. Students are enriched with real-world experience and get to see the daily work of an engineer. If you have any questions or concerns at any point during the semester, please feel free to reach out to me. Please submit this page of the syllabus on Schoology.

Thank you,
Allison Epperson

My child and I have read and discussed the classroom syllabus.

Student Name (Print) _____ Date _____

Student Signature _____ Date _____

Parent/Guardian Name (Print) _____ Date _____

Parent/Guardian Signature _____ Date _____

Email Address(es) _____

Phone number(s) _____ (Cell) _____ (Home) _____ (Work)

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Course Description: The pinnacle of the Engineering Academy presents students with the opportunity to apply the knowledge and skills they have obtained in the previous two engineering classes. This senior-level class will solidify the student's understanding of engineering principles as they leave the campus to intern at local engineering companies. Class time will be spent polishing communication skills and participating in a senior project and report. Students must have a driver's license and be able to provide their own transportation to and from job sites.

Mentorship Clause: Due to the COVID-19 Pandemic, many companies are still working remotely or not taking interns. Even with that obstacle, we managed to get many in person internships and some hybrid! Due to the shortage of in-person internships, some students will be participating in a mentorship program, where they solve a design problem of their choice with the help of a professional engineer in the students' desired field. The 18 week plan on the last page reflects the two pathways.

Pre-Requisites:
Introduction to Engineering Design
Principles of Engineering

Credentialing: Students have the opportunity to become certified in diverse programs that vary at internship cites.

Grading and Assessment: Test grades will account for 70% of the 9-weeks grade, with the remaining 30% being determined by quiz/daily grades. The grading scale is as follows: A (90-100%), B (80-89), C (70-79), D (65-69), and F (below 65). Grades will be a reflection of mastery of the standards. Make sure all absences are excused as class work can be made up and graded for excused absences only. The final exam counts for 20% of the final grade.

Not all assignments will be graded, but students must complete all work. Students will take notes via guided notes, graphic organizers, and other methods in this course.

Communication with Ms. Epperson: As students leave to go to the site, I understand that it is better to be able to contact me in a way that is quicker than email. For that reason, I have created a class-specific Google phone number that students can call or text me on. Students are expected to check in with me every day before they leave for placement, and will be asked to check in with me via the google number the first few weeks they are at their site. This number can be used for easy communication or emergencies because of the unique nature of this course. The number is: **(256)-258-8604.** Parents, feel free to contact me on this number during school hours as well.
Late Work: Per JCHS Policy. All late work is to be submitted within 7 days of absence. Students must submit their late work online to the proper Schoology Assignment AND submit a "Late Work Form" Submission to receive credit. The late work form is checked every 2 weeks and student grades are updated then.

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TSA (Technology Student Association) CTS Integration: Technology Student Association is a National Career Technical organization where students can use knowledge gained from Engineering courses. JCHS's team competes at Alabama TSA convention every year and students in Research and Design can choose to participate in convention.

Embedded Numeracy Anchor Assignment: At each internship site, students will use mathematics to solve diverse engineering problems. Because of this, there is not one sole numeracy assignment.

Embedded Literacy Anchor Assignment: Before students depart for an internship, the first three weeks of class are dedicated solely to internship preparation. This includes student research into available company internships.

Accommodations: Requests for accommodations for this course or any school event are welcomed from students and parents.

Supplies: Students must hold a driver's license and be able to transport themselves to their engineering site. Students are expected to dress appropriately for their workplace.

Procedures:
In the Classroom:

1. ALWAYS TREAT OTHERS WITH RESPECT. WE DO NOT MAKE OFFENSIVE JOKES IN CLASS.
2. DO NOT THROW THINGS ACROSS THE ROOM.
3. DO NOT WASTE VEX MATERIALS.
4. DO NOT SPEAK OVER ME WHEN I AM TEACHING.
5. DO NOT LEAVE MATERIALS OR YOUR THINGS ON MY TABLES WHEN YOU LEAVE.
   Any breaking of rules can result in deduction of professionalism points.

Traveling: Students that travel off-site will be representing JCHS at all times. Students will receive paperwork that must be signed prior to departure and they will obey traffic laws during travel. Students are responsible for any traffic violations made during travel and will report to their placements on time and responsibly.

On Site: Students will be under the supervision of various background-checked/ screened adults at their Internship placement. On site, students are expected to stay the full allotted hours, conduct weekly reports, and conduct themselves in a respectful manner. If there are any issues with the placement, students will let Ms. Epperson know immediately through email, call, or text. Companies will also let Ms. Epperson know immediately if there are any issues with student behavior or punctuality.

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Computer/Internet Appropriate Use Policies: Student laptops should not be hard-wired to the network or have print capabilities. 2. Use of discs, flash drives, jump drives, or other USB devices will not be allowed on Madison City computers. 3. Neither the teacher, nor the school is responsible for broken, stolen, or lost laptops. 4. Laptops and other electronic devices will be used at the individual discretion of the teacher.

Course Goals

Students will:

1. Explain professional, legal, and ethical responsibilities in the field of engineering, including the need for a diverse workforce.
2. Demonstrate effective skills for seeking employment in a specific engineering pathway, including attributes that contribute to a successful engineering career.

- Preparing a résumé using personal, educational, and professional information
- Conducting a job search in a specific engineering field using Internet resources, including education requirements, potential earnings, and need

Project Proposal

3. Create a formal, narrative proposal for an engineering design brief.

Research

4. Conduct independent research related to a chosen engineering design brief.

Design and Evaluation

5. Demonstrate the engineering design process, including defining the problem, developing and selecting solutions, constructing prototype testing, evaluating and documenting results, and redesigning as needed.
6. Apply a standard experimental method to the evaluation process of a given engineering design.

Product and Process

7. Create a written technical report and a multimedia presentation for an engineering design problem, concept, or issue using industry recognized guidelines.
8. Demonstrate correct use and selection of tools, materials, procedures, and equipment in the construction of models, prototypes, and finished products.
9. Apply correct drafting techniques using computer-aided design (CAD) programs to produce plans, diagrams, and working drawings for the construction of models, prototypes, and final products.
10. Design a project portfolio that includes all project-related documentation.

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Instructional Delivery Plan*

	Traditional Internship:	Mentorship Program *
Week 1:	Intro to the class. Resume Building. Career Interest Surveys.	Intro to the class. Resume Building. Career Interest Surveys.
Week 2:	Interview Skills. Public Speaking.	Interview Skills. Public Speaking.
Week 3:	Email Etiquette. Mock Interviews.	Email Etiquette. Mock Interviews.
Week 4:	Interviews.	Interviews.
Week 5:	Interviews.	Interviews.
Week 6:	Internship.	Topic Selection and Critical Questions.
Week 7:	Internship.	Brainstorming and Design Brief.
Week 8:	Internship.	Design Alternatives Table. Decision Matrix.
Week 9:	Internship.	Develop a solution. Written Project Plans. Assign Review Partner.
Week 10:	Internship.	Construct Prototype- Week 1: Performance.
Week 11:	Internship. Midterm Performance Reviews.	Test Prototype- Week 2: Usability. Performance Reviews by Mentors.
Week 12:	Internship.	Test Prototype- Week 3: Durability.
Week 13:	Internship.	Optimize, Construct, Test.
Week 14:	Internship.	Optimize, Construct, Test.
Week 15:	Internship.	Final Prototype Troubleshooting and optimization.
Week 16:	Internship.	Final Prototype Troubleshooting and optimization.
Week 17:	Presentation Preparation.	Presentation Preparation.
Week 18:	Presentations.	Presentations.

*** This syllabus serves as a guide for both the teacher and student; however, during the term it may become necessary to make additions, deletions or substitutions.**
****In the case that students are not placed at an internship site, they complete a mentorship program with a mentor.**