Kyle Owen Rex   **Active Secret Level US Security Clearance**   **Mechatronics (Electrical, Mechanical, & Software) Engineer**
1+ Years Relevant Experience   **(678) 237-2221**   **Kyle.o.rex@gmail.com**   **College Station, Texas (Willing to Relocate)**
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Collegiate Education & Extracurriculars
Texas A&M University College of Engineering, College Station, TX - (TAMU) - (August 2022-Present)
- Current GPA: 3.2 (90 credit hours completed) (On track to graduate in May 2026) (Only engineering major in Corps outfit class).
- BS Multidisciplinary Engineering Technology MXET Mechatronics Major (ABET Accredited) Minor in Embedded Systems Integration.
- The College of Engineering's Mechatronics program focuses on the integration of mechanical, electrical, electronic, & software engineering. Also includes combination of robotics, computer science, telecommunications, systems, control, & product engineering.
- (2) College of Engineering Distinguished Student Awards for Outstanding Academic Achievement for a Semester GPA >3.50.
- Member of the Senior Military College's Corps of Cadets - 1st Brigade 1st Battalion L-1 Lonestar Company.
  - Regular class day begins at 0500 (5am) and ends at 2200 (10pm). Physical Training every morning from 0530 to 0700.
  - Work in a very high intensity, stressful environment - meant to prepare you for success in your career.
  - L-1 Career Readiness Officer, Operations Officer, Logistics Officer, Recruitment Officer, and Squad Leader.
- Army ROTC Reserve Officer Training Corps. Upon graduation I will commission into the US Army Reserves as a Second Lieutenant where I will serve 1 weekend a month and 2 weeks during the summer while pursuing my fulltime long-term engineering career.
  - Experience creating and briefing large scale comprehensive mission operation plans to command staff that last for multiple hours.
  - Squad Leader in command of teaching cadets basic Army skills & leading cadets in combat training operations & physical training.
  - Participation in over (5) Field Training Exercises, ranging from 3 to 7 days long, meant to test ability to lead and perform platoon & squad level operations (Positions include PL, PSG, SL, Weasel, RTO, & Medic) (Performed tactical Blackhawk flight operations).
  - Extensive first aid and emergency medical technician training to handle any medical emergency, combat or non-combat related.
- Former member of Rudders Rangers special Army unit - specializes in small unit infantry tactics and teamwork.
- Former member of the L-1 Bonfire crew - participated in the creation and execution of the annual student led Bonfire celebration.
- Former Peer Notetaker for Texas A&M Disability Services - took notes for students with disabilities.
- Former member of Texas A&M's Aviation Preparatory unit - experience on military grade flight simulators.
- Small business student owner, manager, & entrepreneur (2020-Present). Successfully operate a passive part time online business that I have created with 1 current part-time family employee. Over 2000 items sold with over $60,000 in gross sales since launch.

Professional Engineering Work Experience, Projects, and Internships
Sandia National Labs (May - August 2024) - NASA (January - May 2022) - Textron Aviation (July 2022)
- Sandia National Labs Onsite Summer Weapon Subsystems R&D Internship with the Lawrence Livermore National Laboratory (CA) at the Bush Combat Development Complex Research Integration Center (TX) (Full-time 40-hour work weeks).
  - I joined a collaborative research group focused on developing better testing procedures for, and broadening the understanding of, Switch Mode Power Converters and DC-to-DC feedback-controlled conversion. Specifically focusing on a Buck Converter with a Type Three (III) Compensator system and its analysis. The supporting mission that required this was the improvement of current conventional multi-tap battery systems & technology by transitioning them to a modular power bus-based system; ultimately resulting in improved space missions, nuclear disaster response, radiation hardened systems, & nuclear weapon systems.
  - My individual role included developing a "Method to Obtain Bode Plot of Live DC-to-DC Feedback-Controlled Switch Mode Power Converter with a Tektronix Mixed Signal Comparing Results with Simulink and MATLAB Simulations" which involved the creation and analyzation of bode plots from ideal MATLAB transfer functions, Simulink simulations, and physical circuit tests. The testing procedure and hardware toolset I created were a success and enabled the team to perform tests on other in-development or developed converters. I created a publicized report on the project that can be found on my LinkedIn page.
  - My research partner and I presented our work at the end of the summer in the form of a poster at the CA Summer Intern Symposium & I gave a 10-minute overview presentation of my summer project. The poster, presentation, & speech can be found on my LinkedIn page along with a Sandia Article I was featured in regarding my active participation in career development events.
  - Onsite Mentor Reference: Dr. Matthew McDonough. Work Phone: 505-228-4550. Email: mmcdono@sandia.gov (preferred).
- NASA Virtual Spring R&D Internship with the Ames Research Center (CA) (Part-time 10-hour work weeks).
  - Participated in a collaborative group project involving research on Aeronautical Contributions to Wildfire Management. The goal of this project was to analyze applications for aeronautic vehicles in wildfire management, including analysis of detection and suppression technologies that could be mounted onto manned/ unmanned vehicles. We developed a proof of concept for the implementation of machine learning/ AI into satellites to better predict, mitigate, and manage wildfires to reduce their impact using historical climate and weather data collected from certain geographic areas and programed AI prediction software.
- Textron (Beechcraft and Cessna) On-site Civil Air Patrol Aircraft Manufacturing Academy (AMA) Apprenticeship Program with the Independence Kansas Piston Engine Aircraft Manufacturing Factory and Independence Community College Campus.
  - Developed understanding of manufacturing and quality assurance areas within aircraft production facilities for the Cessna 208, M-2, 172, 206, and 182. Hands on work included Installing AC unit, Starter, Belt drive, Gas lines, and Oil lines onto a 208 Turboprop engine. Installing rivets, cleaning, and performing a damage assessment on the wings of a 182. Detail work on a 206, sanding, buffing, and identifying discrepancies in the paint. Inspecting electricals and insulation of an M-2. Inspecting the torque on wheels of a 206. Quality checks of tools. Upholstery including carpeting, grometing, and sewing. Welding, cutting, & drilling steel beams.

Position Based Skills
Engineering Education and Work Based Technical Skills, Abilities, and Experience

- Electrical, Software, and Mechanical Engineering software skills include familiarization and utilization of MATLAB, Simulink, LTspice, PyCharm, Spyder, Intel Quartus, Google Collaboratory, MobaXterm, Visual Studio Code, Keil uVision5, Tera Term, AutoCAD, Autodesk Inventor, and Automation Studio (Proficient coding languages include Java, Python, and C / C++).
- Electrical and Software Engineering hardware skills include familiarization and utilization of various Tektronix, Picotest, Digikey, Texas Instruments, Terasic, & Keysight electrical equipment. This equipment includes DC power supplies, digital multimeters, oscilloscopes, function/waveform generators, mixed signal oscilloscopes, a FPGA DE_10 Lite board, a MSP432 microcontroller, DC-to-DC Buck Converters, and all types of basic circuitry components. I completed a project which involved building and analyzing a type of analog circuit. I chose to solder and build a "Clapper Circuit" that controlled an LED which turned on and off based on sound inputs.
- Mechanical Engineering hardware skills include familiarization and utilization of various chemical, fluid, and mechanical Testing Equipment. This includes basic chemistry lab equipment, basic fluid mechanics equipment, a universal testing machine, a torsion test rig, a strain indicator, and other mechanical testing equipment required to perform multiple types of hardness, tensile, impact, metallography, heat treatment, Jominy, & cold work testing of metallic materials such as stainless steels.
- Technical Skills include being extremely familiar with professional communication and collaboration methods including Slack, Teams, and GroupMe. I have extensive experience with applications such as MS Office (Word, Excel, Outlook, PowerPoint, OneNote, Access), Google Drive (Docs, Sheets, Slides, Forms), Spreadsheets (Excel, Google Sheets, OpenOffice Calc), and Photoshop.

Pre-Collegiate Education & Extracurriculars
Lassiter High School STEM Academy, Marietta, GA - (LHS) - (2018-2022)

- GPA: 4.1 (STEM Academy PLTW 4 Year Program) (Top 10% out of 500) (10 Advanced Placement (AP) classes completed).
  - Skills learned included Autodesk Inventor CAD/Drafting, 3-D Modeling/Printing, Sketchup, VEX Robotics/coding, Isometric Sketching, Aery, X-Plane/Microsoft Flight Simulation, Spreadsheet Data Analysis, Robot Design/Programming Code, and Presentation Skills.
  - These assignments included using VEX materials and software to build and code machines, Aery to configure aircrafts so that they will fly, X-plane and Microsoft flight simulator to fly a multitude of aircrafts in a realistic simulation, Autodesk Inventor to design large-scale aerial and land vehicle projects, AutoCAD and 3-D printing to create prototype designs like my engineering capstone project which was a heat resistant grill camera capable of remote monitoring food being grilled using Bluetooth.
  - Curriculum included Careers in Engineering, Statistics, Data Collection, Data Analysis, Electromechanical Systems, Material Choice and Testing, Experimental Protocols, and Physics of Flight.
- Naval Junior Reserve Officer Training Corps (NJROTC) Class commander (12th). Only STEM Academy student that was in JROTC. Developed a basic understanding of military etiquette, self-discipline, physical and mental toughness, and commitment to service.
- Lassiter High School Outstanding Achievement award for being 2nd overall in class (Freshman year- 9th).
- Lassiter High School Principals Award for outstanding performance in a class.
- Varsity Sports Football, Swim, and Rugby (Awarded for having the highest cumulative GPA on the entire football team of 57 players).
- Lassiter Math Team, Languages of Lassiter Club, National Science Honors Society, and Student Tutor for Pre-Calc students.
- (AP Capstone 2 Year Program) Use of writing programs to complete extensive professional writing assignments in 7th edition APA format. Capstone project was an extensive research paper on how international sport affects foreign relations.
- Graduated from US Coast Guard Academy AIM 2021 summer program (Modeled Coast Guard basic training) onsite of USCGA.
- Member of the Sons of the American Legion and Georgia Boys State 2021 Graduate. Elected Commissioner of Labor (5th position).
- United Methodist Christian Church Youth Group Leader. Organized events and service projects including a summer lunch program.
- Lifeguard, Senior Lifeguard (2019-2020). Served as a Head Supervision Lifeguard at multiple pools training new lifeguards how to operate the pools and how to act in emergency situations. Red Cross Lifeguard, CPR, and AED Certification.

Boy Scouts of America - (BSA) - (2010-2023)

- Boy Scout Eagle Rank. Awarded for fulfilling leadership positions, service hours, merit badges, and planning service projects.
- Attended NYLT (National Youth Leadership Training) weeklong leadership training program (Group/ Patrol Leader).
- Positions included Troop/ Patrol Leader, Troop New Scout Guide, and Assistant Scout Master.
- Assistant Unprofessional Scouting Firearms Instructor. Instructed many inexperienced scouts in the safe use of firearms.
- Participation in the Memorial Day flag ceremony at Marietta National military cemetery every year since 2012.
- Attended 3 out of 4 BSA High Adventure Bases including Summit Bechtel National Scout Reserve, Florida Sea Base, and Philmont.

US Air Force Auxiliary - Civil Air Patrol - (CAP) - (2021-2023)

- Cadet Technical Sergeant. The program helped further develop my leadership skills, aerospace/ aeronautical engineering skills, physical/ mental capability, leadership, and individual character. Flight Sergeant for alpha flight in my home squadron.
- Georgia Wing Week-long Summer Encampment at Air National Guard base, Air Dominance Center. Awarded NCO of the Encampment, NCO of the day for day three, and Honor Squadron of the Encampment. Flight Sergeant (NCO) of Foxtrot flight in charge of 13 cadets and taught them basic CAP, Air Force, and general military knowledge, drill movements, and customs/ courtesies. Orientation flights in a C-17 Globemaster and a UH-60 Blackhawk and walk through of C-130 Hercules & CH-47 Chinook.
- Florida Wing Week-long Winter Encampment at Army base, Fort Blanding. Graduated the modeled Air Force basic training program.
- Path towards Private Pilot's License. FAA (Federal Aviation Administration) Certified Student Pilots License. FAA 1st class medical certificate. Orientation flights in a single engine Cessna aircraft and glider. FAA Certified Recreational Drone Certification (TRUST).

Texas A&M Engineering Education Class Detailed Summaries

- (ENGR 102, Engineering Development in Python) Use of PyCharm and Spyder software to perform coding assignments in Python. Topics included Sequential Steps, Variables, Assignment, Data Types Input/Output, Modules, Calling Functions, Conditionals, Boolean Expressions, Creating & Testing Programs, Basic Debugging, Loops, Iteration, Arrays, Lists of Data, Top-Down Design of Programs, Advanced Functions, Scope, File Input & Output, Systematic Debugging, Functions & use in top-down/bottom-up design. The code for this class can be found on my GitHub page.
- (ESET 210, Circuit Analysis) Use of Breadboards, Digital Multimeter, DC Power Supply, Resistors, and other basic circuitry equipment to conduct experiments testing and proving the different methods of circuit analysis.
- (ESET 219, Digital Electronics) Use of Intel Quartus Digital Electronic System Circuit Design Software to create, test, and translate various complex circuit designs to complete assignments on a FPGA DE_10 Lite board. Designs included Minterm/Maxterm Design, Simplified Digital Design, Encoder & Decoder Design, MUX & Comparator, Flip Flops, State Machines, Counters, & PWM Designs.
- (MMET 207, Metallic Materials) Use of Mechanical Testing Equipment to perform Hardness Testing, Tensile Testing, Impact Testing, Metallography & Solidification, Vickers, Heat Treatment of Steels, Pack Carburizing, Jominy Testing, & Cold Work of Stainless Steels.
- (MMET 275, Mechanics for Technologists Statics) Use of technical drawing and writing to develop a better understanding of structural design and analysis, mechanical force systems, 2D/3D equilibrium systems, and internal forces developed in structural members.
- (MATH 151 & 152, Engineering Calculus 1 & 2) Use of Google Collaboratory (coding software) to perform coding assignments in Python related to the mathematical functions we were learning in class at the time.
- (PHYS 206 & 216, Engineering Physics Mechanics) Use of MobaXterm software with a Physics Air table & Mounted Cameras to perform experiments involving data acquisition, visual tracking & odometry using a computer numerical control (CNC) feature. These experiments included Error analysis & orientation, Visual odometry, Force evaluation, Collisions, and Rotational & Harmonic motion.
- (CHEM 107 & 117, General Engineering Chemistry) Use of basic chemistry equipment to perform experiments involving Data and Graphics, Scientific Measurement, Significant Figures, Quantitative Reactions & Analysis, Statistics of Laboratory Data, Gas Laws, Scientific Literature and Safety, Nanoparticles, Calorimetry, and Scientific Writing.
- (ESET 269, Embedded Systems Development in C/ C++) Use of Visual Studio Code, Keil uVision5, Tera Term, and MSP432 microcontroller to perform coding assignments and projects in C. Topics included Variables, Printf/Scanf, If-Else, Switch, Loops, Math Operations, Relational Operations, Logic Operations, Arrays, Strings, Pointers, Functions, Structures, Header Files, MSP432 Overview, Bitwise Operations, Digital I/O, Timers, UART, and Embedded System Design. The final project involved creating a code sequence to measure and configure the inputs and outputs of a MSP432 controller including the LEDs, Buttons, and Internal Temp. The code for this project and the class can be found on my GitHub page.
- (ESET 350, Analog Electronics) Use of DC Power Supply, Digital Multimeter, Oscilloscope, Function/Waveform Generator, and other electrical equipment to conduct experiments testing and analyzing Analog Circuits. Topics included Semiconductor Theory, Types of Materials, Current Flow, PN junction, Characteristics of Diodes / Special Diodes, Ideal response, practical response, Actual Response, Diode Equivalent Circuit Analysis, Diode Applications (Rectifiers, Power Supplies, Clippers / Clampers, LEDs), Op Amp Characteristics, Op Amp Applications, Op Amps (Transistor composition, Ideal Characteristics, Actual Characteristics, Basic configurations, Buffer, Inverting, Non-inverting), Active Filters (HP, LP, BP, BR), Filter Concepts, Higher Order Act. Filters (Butterworth and Chebyshev, Multi-stage Filter Systems, Gain bandwidth product), Bipolar Junction Transistor (BJT), BJT as a Switch (Biasing, Characteristic curves, Q point), MOSFET Applications, AC and DC amplifier analysis, Input / Output impedance & measurement, Voltage gain calculations, and Field Effect Transistors (JFET, MOSFET). The final project involved building and analyzing a type of analog circuit. I chose to solder and build a "Clapper Circuit" that controlled an LED which turned on and off based on sound inputs. The report for this project can be found on my LinkedIn page.
- (MMET 303, Fluid Mechanics & Power) Use of MATLAB and Automation Studio to conduct experiments in order to gain an understanding of the basic concepts and principles of fluid mechanics. Topics included Fluid property measurements - Viscosity and specific gravity, Pressure measurement and gauge calibration, Flow measuring devices, Fluid Friction and pressure loss, Positive displacement pumps, Dynamic pumps, Fan efficiency, and Advanced Hydraulic circuit diagrams and valves. The code for this class can be found on my GitHub page.
- (MMET 376, Strength of Materials) Use of Universal Testing Machine, Torsion Test Rig, Strain Indicator, Strain Gauges, Cantilever Beams of Different Materials, and Thin Walled Aluminum Cans to conduct experiments in order to Analyze the stresses due to normal force, shear force, torsion, and bending, determine combined stresses at critical locations, use Mohr's circle for stress transformation and principal stresses calculation, and interpret experimental results and identify probable sources of experimental errors. Topics included Stress and strain; elastic moduli Poisson's ratio; torsion, bending, unsymmetrical bending; design of beams and shafts, and material and strength characterization laboratory tests.

Personal Interests, Hobbies, and Activities

- Avid outdoorsman participating in white water rafting (Highlight: completed the most difficult river in the US the Upper Gauley River in West Virginia- Class 5), hiking/trial running, backpacking (Highlight: completed over half of the Appalachian trail in Georgia), climbing (Climbing, repelling, ziplining, and rope courses), canyoneering, fishing, mountain biking, sports shooting, snow skiing, and motorcycling.
- Passionate craftsman participating in wood carving, leathercrafting, and blacksmithing.
- Extensive United States Numismatic and Indian Artifact collector/expert.