### Course Syllabus

### 2019-2020

### Aircraft Electronics

### CIP Code - 47.0609

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**COURSE DESCRIPTION**

Welcome to Aircraft Electronics at the Kent Aviation Center! This nationally accredited, one of a kind, two-year NCATT (National Center for Aerospace and Transportation Technologies www.astm.org) certified course introduces students to the knowledge and skills required in the field of avionics equipment installation and repair. Avionic systems are the heart of an aircraft, and include navigation, communication, and anything electrical for an aircraft. Avionics technicians install, test, and repair all electrical components on an aircraft. With the introduction of Unmanned Aircraft Systems (UAS), Avionics systems are advancing at an unforeseen rate, and a demand for avionics technicians are at an all-time high. Students who succeed in this program, and receive their NCATT Aircraft Electronics Technician (AET) are highly likely to receive a job offer after graduating from this program.

Year one establishes basic and introductory electrical knowledge and teaches aircraft, electrical, flight line, and hangar safety. **After the first year, students will be prepared to take the NCATT AET (Aircraft Electronics Technician) exam which grants national certification**. In year two, students learn more advanced avionics systems. Year two students will work on the same projects that industry technicians work on, including wiring up a complete avionics system into an actual aircraft. **After the second year, students will be prepared to take multiple NCATT endorsements (pre-requisite = AET)**

**NCATT INFORMATION:** The NCATT AET, through ASTM International, is an industry-level certification, and KCTC is the only high school in the country to offer this certification to High School age students. The AET is a pre-requisite for many entry level jobs. The test is taken in the classroom, proctored by a member of our advisory committee, and costs $175. More information, including the testing standards, can be found here (<https://www.astm.org/CERTIFICATION/filtrexx40.cgi?-P+PROG+10+cert_detail.frm>). Additionally, first year students will have the opportunity to take the Foreign Object Elminiation Certification (<https://www.astm.org/CERTIFICATION/DOCS/222.NCATT_FOE_Standard.pdf>). This certification costs $135. This industry certification is sought after for most employers.

For second year students who have their AET, we will be focusing on the endorsements to advance their skill set and knowledge. Students will be taking the following endorsements (linked are the standards to each test): Radio Communication Systems (<https://www.astm.org/CERTIFICATION/DOCS/220.NCATT_RCS_Standard.pdf>), Dependent Navigation Systems (<https://www.astm.org/CERTIFICATION/DOCS/219.NCATT_DNS_Standard.pdf>), and Onboard Communications & Safety Systems (<https://www.astm.org/CERTIFICATION/DOCS/221.NCATT_OCS_Standard.pdf>). The tests will be taken in the same format as the AET, and the costs are $135 each.

**Course Topics**

**Year 1**

Foreign Object Elimination (6 weeks)

Direct Current (5 weeks)

Semiconductors (4 weeks)

Digital Logic (4 weeks)

Frequency Generation (4 weeks)

Fund. of Avionics (5 week)

Aircraft Wiring (5 week)

Careerability (3 week)

**Year 2**

Installation Buddy Project (5 weeks)

Radio Communications (4 weeks)

IFR 6000 Training (4 weeks)

Dependent Navigation Systems (4 weeks)

Pitot Static Systems (6 weeks)

Onboard Communication Systems (3 weeks)

Surveillance Systems (5 weeks)

Autonomous Navigation Systems (5 weeks)

**Resources/ Textbooks**

Avionics Training: Systems, Installation and Troubleshooting (supplemental)

Avionics: Fundamentals of Aircraft (supplemental)

Avionics: Beyond the AET (supplemental)

 Edify

 Moodle

 Google Classroom

# **Important Dates**

Here are some important dates to consider for the upcoming year.

August 30 – Holiday break

September 2 – Holiday break

October 18 – End of 1st quarter

October 24 – Aviation Center Open House

 **November 21 – College Expo**

 November 27-29 – Thanksgiving break

 December 9-13 – 1st evaluations December 20 – End of 1st semester

 December 23-January 3 – Holiday Break

 February 17-18 – Mid Winter Break

 March 12 – Aviation Center Open House

 March 13 – End of 3rd Quarter

April 3-10 – Spring Break

 **May 6 – Business and Industry Expo**

 May 11-15 – 2nd Evaluations

 May 15 – Seniors’ last day

 May 25 – Memorial Day

 May 29 – Last day of School

\*NOTE: Events Bold and Underlined mean we will be meeting at Main Campus on those dates. These dates are tentative and may change

**Articulation**

In order to further education, this program is constantly working with colleges to reach an articulation agreement. Currently, this program has an agreement with Grand Rapids Community College (GRCC). After completion of this program, students need to fill out paperwork to receive accreditation through GRCC. Depending on grades, students can receive up to 11 credit hours.

**CTSO Opportunity**

Students have the opportunity to join multiple aviation clubs to enhance their leadership potential. Women in Aviation, GR Makers are just a few that students can join. We also have a drone club that is open to all Aviation Electronics students. Some time will be given to students during class, but there may be events outside of class for students to attend. Skills USA is a statewide competition for electronics. It is available to any student and is a great opportunity for students to enhance and test their skills learned in the classroom. More information will be available later in the year.

**Attendance**

If a student is expected to be absent, please call or email the teacher. Once the student comes back from an absence, they have 3 days to turn complete any makeup work. I will keep a ‘ghost folder’ in the classroom, so if a student misses a day, s/he is required to check it to receive any worksheets they may have missed. Additionally, students should get with another student to catch up on anything they missed.

**Code of Conduct**

Whenever there is a guest presenter or substitute you represent the class as well as myself. I expect everyone to be on their best behavior on these days. Please don’t check your phone, or fall asleep (or put your head on your desk) when there is a guest presenting. They are taking time out of their day to talk to you, so please make sure you give them your full attention, and show respect.

Plagiarism on any assignment will result in a zero for the assignment. Cheating will not be tolerated. Some tests or quizzes will be taken online. Unless I tell you otherwise, looking up answers on the internet is cheating and will result in a zero. I will periodically check the browsing history on the student’s computer. Some quizzes and tests will be open-note and open book, but I still do not want students using the internet to find answers (most of the time the internet is wrong anyway….)

DO NOT WEAR HEADPHONES OR CHECK YOUR CELL PHONE WHILE WALKING OR WORKING IN THE HANGAR. Students have been injured in the past by walking into airplanes not paying attention.

Technology is used for learning. Use the internet (when it is permitted) to further your learning for the class. If you are watching YouTube, or last night’s game, you are wrong. Our time together is valuable. Please waste your own time somewhere else.

**Further classroom expectations will be decided as a class.**

**GRADING**

**QUARTER GRADES (9 WEEKS) = 70% TECHNICAL SKILLS (tests, quizzes, signoffs/homework) + 30% CAREER AND EMPLOYABILITY (time cards)**

KCTC issues grades on a quarterly (9 week) basis. This quarter grade is composed of 70% Technical skills and 30% Career and Employability skills.

**Technical Skill Grading (70%) –** Technical skill grades are issued on assignments and assessments which represent a total number of points earned. This total number determines a percentage of points earned and a letter grade is assigned accordingly. Assignments and assessments in this type of grading are categorized as either formative or summative. Formative work guides learning. Summative work measures how well something has been learned. Summative work is weighted more than formative work. Students may earn the opportunity to redo or retake summative assignments and assessments. ALL technical assignments can be retaken and I will take the most current grade. These retakes must be completed by the end of each quarter. The technical grade is broken down into the following categories:

* Quizzes (20%) – plan on a quiz every week
* Test (30%) – there will be at least 8 tests taken throughout the year including, but not limited to:
	+ Foreign Object Elimination
	+ Safety
	+ Direct Current
	+ Alternating Current
	+ Semiconductors
	+ Frequency Generation
	+ Foundation of Avionics
	+ AET Pretest
* Signoffs/Homework (20%) – similar to the military, this is a list of objectives that the student needs to master. This may include creating a project, troubleshooting something, or orally answering questions. It may also involve building an electronic project. Projects are given on a weekly basis and are due on Fridays. There may also be homework and other packets that fall under this category. NO MAKEUPS ALLOWED.

Pre and Post Testing – at times, students will be asked to complete pre-instruction assessments to aid the teacher in designed learning. These pre-assessments will be scored, but they will not affect the student grade. It is important for a student to make their best attempt on a pre-instruction assessment to help the teacher design appropriate instruction. After instruction, the student will complete a post-instruction assessment to determine how well they learned the skill. This will be scored and this will affect the student grade.

**Career and Employability (C&E) Grading (30%) –** Students will be given a C&E grade every week based on their tardiness, turning assignments in on time, teamwork, and general classroom behavior. Since this class prepares students for the workforce, their C&E grade will be based on a job performance review. An A would be a promotion rating. B would be good performance. C would be on probation. D and below would be grounds for termination. At the end of each quarter, students will be given a feedback session. Students must provide ALL timecards, quizzes, tests, projects and notes to give feedback on their progress on the quarter.

Students will be issued Career and Employability summative scores at least twice per quarter to provide feedback on the skills of Teamwork, Problem Solving, and Personal Management. Students will also earn scores in Career Planning. The combination of these scores will determine the Career and Employability grade.

**SEMESTER GRADE = (45%) Q1 + (45%) Q2 + (10%) Evaluation**

The semester grade is determined by combining the two quarterly grades and the semester industry evaluation. Each quarter counts for 45% of the grade and the industry evaluation counts for 10% of the grade. When viewing grades on PowerSchool, it is always important to look at the S1 or S2 grades as the overall in-progress grade for the course.

**Quarter 1 and 2 –** Explained above

**Evaluation Grading (10%) –** Each semester, students are evaluated by the members of the Aviation Electronics Program’s Advisory Committee. These are professionals in the Avionics industry. The evaluations include hands on practical projects and oral quizzing. The Evaluation constitutes 10% of the semester grade. Attendance is mandatory during the evaluation, and no make-ups will be allowed; unless in the case of an emergency.

**2019-2020 Model Syllabus Language for Grading**

KCTC supports grading practices that are consistent, accurate, meaningful and supportive of learning.

KCTC grades are reported in two ways – Semester grades (A, B, C, D, E) and a year-end Certificate identifying a proficiency level on each course standard.

Additionally, scores are issued to students to reflect the proficiency level they have achieved on particular Industry Standards. The Standards scoring scale: 0 – Not attempted or Minimal Knowledge, 1 – Beginning Proficiency, 2 – Developing Proficiency, 3 – Proficient (meets industry standard), and 4 – Advanced Proficient. Students will also be issued a quarterly Standards score (0 – 4) in the Career and Employability skill areas of Teamwork, Problem Solving, Personal Management, and Career Planning. At the end of each year, students will be issued a Standards score (0 – 4) in the area of career writing proficiency and math proficiency as well. These scores are reported on the year-end Certificate which is used by employers to assess industry skill levels.

Attached is a grading table to understand what each grade means.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rubric Average Range\* | Score out of 100 to enter into Gradebook | Description | Standard Score  | Letter grade |
| 3.50 | 4.00 | 100 | Advanced | 4 | A |
| 3.25 | 3.49 | 97 | Proficient | 3 | A |
| 3.00 | 3.24 | 94 | Proficient | 3 | A |
| 2.80 | 2.99 | 90 | Proficient | 3 | A- |
| 2.51 | 2.79 | 87 | Proficient | 3 | B+ |
| 2.31 | 2.50 | 84 | Proficient | 3 | B  |
| 2.11 | 2.30 | 80 | Proficient | 3 | B- |
| 1.91 | 2.10 | 77 | Developing | 2 | C+ |
| 1.71 | 1.90 | 74 | Developing | 2 | C  |
| 1.50 | 1.70 | 70 | Developing | 2 | C- |
| 1.25 | 1.49 | 67 | Beginning | 1 | D+ |
| 1.00 | 1.24 | 64 | Beginning | 1 | D  |
| 0.75 | 0.99 | 60 | Beginning | 1 | D- |
| 0.50 | 0.74 | 57 | Minimal knowledge  | 0 | E |
| 0.01 | 0.49 | 54 | Minimal knowledge  | 0 | E |
| 0 | 0 | 50 | Minimal knowledge  | 0 | E |
| 0.00 | 0.00 | 0 | Student did not Attempt | 0 | E |
| Not Assessed by the teacher |   |   | Not Assessed | [Blank] | [Blank] |

**With your full participation and focus this will be a revelatory, rewarding, and enjoyable year of aeronautical learning. Welcome to Aviation Electronics! ☺**