Course Syllabus

Edit

Naperville Central High School

Electronics

District 203 Mission:

The mission of Naperville School District 203 is to produce students who are: self-directed learners, collaborative workers, complex thinkers, quality producers, and community contributors.

NCHS CTE Mission:

In partnership with the community, Career and Technical Education (CTE) provides students with real-world experiences. Students will discover and explore their passions which will lead to career opportunities and the development of lifelong skills.

Teacher: Mr. Kischuk

Room: 51

Level: freshman – senior

Prerequisite: Algebra 1, completed or concurrently enrolled

Duration of course: two semesters, full year course

Credit: 1.0 CTE credit.

College of DuPage: Course is dual credited with the College of DuPage, see below for more information.

Teachers contact information: classroom phone 630-579-7209

email: Mr. Kischuk **dkischuk@naperville203.org (mailto:bthompson@naperville203.org)**

Additional help: Additional help is always available. Please feel comfortable asking for additional help or lab time. SOAR Support is the best time for additional support and access to the lab. If needed, other arrangements can be made for additional support before school, during lunch, or after school.

Course Description

This two semester course covers essential concepts in electronic circuit theory and application. The course is designed for those students who have an interest in technology and engineering. The course begins with an introduction to electrical properties, electrical quantities, and electronic component behavior - components such as resistors, switches, capacitors, diodes, LEDs, transistors, and the 555 timer will be studied. Next, circuit analysis and design are studied through Ohm's Law and Watt's Law with application to series, parallel, and combination circuits. Follow-on topics include the study of magnetism, electromagnetism and related AC circuit behavior. Lastly, students study the design and operation of diodes, transistors, digital electronics, and microcontrollers (Arduino) and their applications in more complex semiconductor and digital circuits. Throughout the year, students will learn to use various types of electronic laboratory equipment and processes including power supplies, digital multimeters, function generators, oscilloscopes, breadboarding, prototyping, and soldering while performing laboratory experiments and engineering challenges that accompany the studied topics. Students will also experience the engineering design process which includes circuit design, modeling/simulations, fabrication, and troubleshooting. For many students, this will be their first exposure to engineering, design, and troubleshooting. The course will challenge your tenacity, your ability to think complexly, and your ability to solve engineering challenges - all in a collaborative, nurturing, and supportive environment.

Topical Outline

First semester

Safety	Unit 1: Introduction to electricity and quantities	Unit 2: Engineering Notation, resistors/color codes, digital multimeters
Unit 3: Ohm's Law and Watt's Law, breadboarding, power supplies	Unit 4: Electronic Components	Unit 5: Soldering
Engineering Challenge #1	Unit 6: Multi-load Circuits	Engineering Challenge #2

Second semester

Unit 8: Magnetism and Electromagnetism	Unit 9: Alternating Current	Unit 10: Semiconductors: Diodes
Engineering Challenge #3	Unit 11: Semiconductors: Transistors	Unit 12: Digital Electronics
Engineering Challenge #4	Arduino Microcontroller	

Course Safety

Maintaining safety in the classroom and on the job is imperative. Learning and developing excellent safety habits begins in the classroom and continues in to the employment arena. The best suggestion for practicing safe habits is to **THINK** before acting. As part of the program of study you will be operating electronic equipment, test equipment, and soldering irons. Therefore, I ask that you read and understand the following class safety rules completely:

- Always wear safety glasses when soldering or cutting.
- Always warn nearby students of a hot solder iron and always keep the solder iron in its holder when not in use.
- Always use the one hand method when working with unknown voltages.
- Always clean up your lab area and return all tools and equipment.
- The student will be responsible for any equipment damage caused be neglect, carelessness and/or rowdiness.

Required Materials

- Scientific calculator - TI-83/84 - as needed
- Chromebook - everyday
- Writing utensil – everyday
- Textbooks are available to use in the classroom as a class set.
- All other materials and course supplies will be provided.

Grade Calculation

Grades communicate each student's progress toward mastery of the learning targets for the course. Students will see two categories of grades in the course:

- Formative work (0%) is used to monitor student's learning to provide ongoing feedback that can be used by students to improve their learning. Examples include: unit packets, labs, practice activities, etc.
- Summative work (100%) is used to evaluate student learning at the end of an instructional unit or comprehensive project. Examples include unit quizzes and Engineering Challenges.

<u>Formative Assignments</u>

- All Formative work is expected to be completed and submitted by the due date, but no later than the end of the unit.
- Missing Formative assignments will be flagged as Missing in Infinite Campus. Families will get a Missing assignments report every Friday afternoon. A student with multiple missing assignments

may be recommended for Redhawk Recovery and/or SOAR Support. At the conclusion of the unit, any Missing assignments will be converted to a zero.

Formative assignments will be scored on a 5 point scale, 0-4 points, as noted below:

Scale	Description	Percentage	Proficiency
4.0	Demonstrated mastery of unit's learning targets. The student exceeds by working on related extension activities and/or coaching other students.	95	Exceeding
3.0	Demonstrated mastery of the unit's learning targets.	85	Mastery
2.0	Demonstrated proficiency of the unit's learning targets.	75	Proficient
1.0	With help, the student has partial success at levels 2.0 or 3.0	65	Approaching
0	With help, the student has no success or evidence of learning the unit targets	55	Insufficient evidence

Summative Assignments

Unit Quizzes and Engineering Challenges will be scored as Summative assignments. All Formative assignments (0% of semester grade) lead up to and prepare students for Summative assignments (100% of semester grade). Therefore, although Formative assignments have zero calculated influence on your semester grade, it is important that you do your best work on Formative assignments and turn them in on time as they will prepare you for the Summative assignments (Quizzes and Engineering Challenges), and they will determine your Quiz retake options as well.

Quiz retakes will be allowed under the following conditions:

- All assigned Formative work for the unit has been submitted.
- Quiz retakes will not be allowed for any quiz grade at 85% or higher
- If you choose to do the Quiz retake, your retake grade will be the final calculated grade - even if the retake grade is lower than your first Quiz grade.

Engineering Challenges are lengthy projects, therefore multiple and varied opportunities throughout the project to get feedback from your teacher and to make corrections or changes in the moment serve as the retake opportunity.

Engineering Challenges

Engineering Challenges do have due dates. I provide a generous amount of time to complete the engineering challenges in class - usually two - three weeks. However, every student works at their own pace. If you need additional time, I will be more than happy to work with you to create a reasonable timeline for finishing and submitting your project. Please note that I will not provide any formal time in class for you to complete the engineering challenge after the due date. Your Engineering Challenge will need to be completed during SOAR Support, or on your own time before school, after school, or during your lunch period. Students who need additional time on Engineering Challenges will be given up to an additional two weeks to complete their project. After the additional two weeks, students will need to submit their project and documentation - whether the project is completed or not. Project points will be deducted if project is not submitted after the additional two weeks.

Grade Distribution

100% – 90% = A	79% – 70% = C	59% – no guarantees
89% – 80% = B	69% – 60% = D	

Rounding of Grades Policy

I will round up final cumulative semester grades at 0.5. For example, an 89.5% or higher will round up to an “A”.

Final Exam

The first semester final exam is a traditional content-based, multiple choice exam. The second semester final exam is a written metacognitive reflection and self-assessment.

Student Communication

- Students are encouraged to communicate with their teacher regarding questions.
- I will make every effort to respond to emails and phone calls within 24 hours during the school week.
- The best way to communicate with your teacher is in person during class or through email. If you haven’t received an email reply within 48 hours, please resend the email or call my voicemail. Your email may have been filtered.

Tardy Policy

Please make every effort to be in class on time as late entry disrupts the learning process. In the event you cannot make it to class on time, NCHS uses a building-wide tardy tracking system during all periods of the day. A student will have consequences with their Dean if they accumulate 5+ tardies from any of their classes combined. If you are late to class, please stop at one of the Plasco stations before coming to class. You must have your ID with you at the Plasco station.

Absences

I allow a reasonable amount of time to submit written work and lab work when you have an excused absence. A reasonable amount of additional time can be allowed if the discussion between the student and teacher justifies the need.

Chromebooks

Please have your Chromebook charged and ready to use daily.

Hall Passes

Restroom passes are allowed for **emergencies only**, if asking to use the restroom please ask judiciously.

Academic Honesty and Integrity

Violation of Naperville Central High School's policies regarding academic honesty and/or integrity will be referred to your Dean for disposition. See pages in your school handbook for appropriate academic behavior. The classroom teacher and administration will collaborate and exercise professional judgment in determining academic integrity violations.

Family Partnerships

School and family partnerships provide students with the best opportunities to succeed.

Some ways families can support their student’s learning include:

- Actively check Infinite Campus for their student’s grades.
  - Infinite Campus is a tool to progress monitor student work until the final course grade is posted.
  - Monthly progress grades are posted and represent the current grade of a student in the course at that moment in time.

- Discuss missing assignments and due dates, help organize folders, materials, assignment notebooks, and discuss current learning, projects, and assessments.

Dual Credit

This course is dual credited with the College of DuPage, courses ELECT 1100 and ELECT 1101. **Students must opt-in/enroll** in the dual credit program to receive the college credit at the end of the semester. **Students are not automatically enrolled into the dual credit course, you must register.** Registration information will be available during the first week of the semester for **each semester**. With parental approval, every student is expected to enroll in the dual credit option.