TEXAS A&M UNIVERSITY
SAN ANTONIO

Texas A&M University-San Antonio
College of Science and Arts
Computations, Engineering, Mathematics Sciences
Electronics Systems Engineering Technology
ESET

ESET 2302/2102, **Analog Circuits Lecture and Lab**
Spring 2026, CRN: 24219, 24218

Course Syllabus

Instructor:	**Wael Deabes**, Ph.D. Office: 211K (STEC Building) E-Mail: wdeabes@tamusa.edu Student emails will receive a reply within one business day.
Class Modality:	Face to Face (F2F)
Credit Hours:	**3** Credits (Lecture) +**1** Credit (Lab)
Meeting Time and Place:	**Lec.:** Monday 11:00 AM - 1:45 PM, **Lab:** Wednesday 11:00 AM – 1:45 PM, Room: STEM 245
Class Duration:	01/16 – 05/07
Course Website:	https://tamusa.blackboard.com/
Office Hours:	Monday & Wednesday: 02:00 – 03:00 PM (In person) Email the professor for communication to zoom meeting (Mon – Fri)

Course Description: Study of semiconductor devices, including diodes, bipolar junction transistors (BJT), field-effect transistors (FET), MOSFETs, and operational amplifiers (op-amps). Fundamental principles and applications of BJT and MOSFET amplifiers, focusing on essential concepts such as biasing, AC coupling, small-signal analysis, and frequency response. Current mirrors, differential amplifiers, and the design and analysis of op-amp circuits, including amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers, and oscillators. Practical applications, such as signal conditioning, power supplies, active filters, discrete transistor amplifiers, and transistor switching/driver circuits.

Prerequisite: ESET 2101, ESET 2301, **Corequisite**: ESET 2102, MATH 2314.

Course Contents: (*Subject to change based on relevance and time)

- Introduction to Semiconductor Devices
- Bipolar Junction Transistors (BJTs)
- Field-Effect Transistors (FETs) and MOSFETs
- Operational Amplifiers (Op-Amps)
- Differential amplifier principles and applications
- Design and Analysis of Analog Circuits
- Practical applications and hands-on exercises

Course Objectives:

- Explain the physical principles and operational characteristics of semiconductor devices, including diodes, BJTs, FETs, and MOSFETs.
- Analyze and design BJT and MOSFET amplifiers, incorporating biasing techniques, AC coupling, small-signal models, and frequency response considerations.
- Design and analyze circuits using operational amplifiers, including amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers, and oscillators.
- Apply theoretical concepts to design practical circuits for signal conditioning, power supplies, active filters, transistor amplifiers, and switching/driver circuits.

- Gain practical experience in designing, building, and troubleshooting analog circuits for improved performance and reliability.

Learning Outcomes:

After taking this course, students are expected to have attained the following knowledge and abilities:

- Demonstrate an understanding of the operation, characteristics, and applications of diodes, BJTs, FETs, and MOSFETs.
- Design, analyze, and optimize BJT and MOSFET amplifier circuits, including biasing, small-signal analysis, and frequency response.
- Construct and evaluate op-amp-based circuits, including amplifiers, active filters, oscillators, and signal processing applications.
- Develop and test practical circuits for power supplies, signal conditioning, and transistor switching/driver applications.
- Diagnose and resolve issues in analog circuits, ensuring optimal performance and reliability.
- Build a strong foundation for further studies in electronics and gain skills relevant to careers in hardware design, embedded systems, and analog circuit engineering.

Required Materials:

Textbook:

[1] Earl Gates, "***Introduction to Electronics***," 6th Ed., ISBN-13: 978-1111128531

[2] Neamen, Donald A., "***Microelectronics: circuit analysis and design***," 4th Ed., ISBN-13: 9780078028205

Open Resource Ebook (no Cost):

[3] James M. Fiore, **"*Semiconductor Devices: Theory & Application*"**, ISBN-13: 978-1796543537: PDF

i. Laboratory Manual for Semiconductor Devices: Theory & Application, James M. Fiore (OER): PDF

[4] James M. Fiore, "***Operational Amplifiers & Linear Integrated Circuits***", 3rd Ed., ISBN-13: 978-1796856897: PDF

i. Laboratory Manual for Operational Amplifiers & Linear Integrated Circuits/3E, James M. Fiore (OER): PDF

Blackboard: Connect to http://tamusa.blackboard.com. You will have lecture notes, solutions to problems, multimedia materials, and other supplementary materials in Blackboard. All class communications will be through Blackboard, and students should monitor this several times a day.

Time Expectation for coursework: You are expected to spend 3-6 hours per week for the course. Based on the background, some students may require more time. Time spent may be longer when assignment/exams are due.

Course Grades and Polices:

- Final grades will be assigned using the weighted average of the following components.
- The instructor reserves the right to adjust the grading scale and/or weights based on the difficulty of work assigned throughout the semester.

- **Lecture Grading Policy**

  - **Class works 30 %:** Quizzes 10%, Homework & Computer Assignments 20%.
  - **Final Project 20%:** (Details under Final Projects item)
  - **Exams 50%:** (15%, 15%, 20%)

- **Lab Grading Policy**

  - **Attendance 10%:** it is a must.
  - **Lab works 50 %:** Run the experiments
  - **Technical Reports 30%:** (Details under Appendix A)
  - **Technical Discussion 10%**

  Course grades are awarded as follows:
  A: Over 90.0%; B: 80.0 ~ 89.99%; C: 70 ~ 79.99%; D: 60.0 ~ 69.99%; F: less than 59.99%.

- **Reading Assignment (RA):** Students are required to read specific sections in the textbook before each lecture, to enable a teaching style somewhat like a "flipped classroom", i.e., concentrating on the intuitive understanding of the material, computational problems, etc., instead of derivations of equations.
  - RA (not graded) should be completed 11:59 pm CST every Friday, + Questions from students need to be posted on Discussion Board by midnight every Saturday!

- **HomeWorks** will be assigned, falling mainly into three categories.
  - Computational exercises related to the specific chapters treated during the past instruction week.
  - Computational exercises requiring a "big picture" approach, using material from different lectures throughout the semester.
  - Simulations to be written by the students to cover more realistic scenarios for which closed-form equations often do not exist.

- **Lab Report:** Due every Wednesday next week. See Appendix A below for Laboratory Report Format and Guidelines + General Rubrics.

- **Final Project:** To pass this class, students must prepare a report and present it during Finals Week. Students will work in teams (if possible, 1-2 students/team). Each team will identify (or use previous) a practical electronic engineering project (e.g., research, prototype, product, or design) and submit their project plan with a timeline at **week 4** to the instructor for approval. Each team will have to submit a report that describes and analyzes the main findings (Week 14-15) and present the work in Class (during Finals week). The Report should not exceed 10 pages double-spaced, 12 font sizes with 1-inch margins, and the Final presentation should not exceed 25 slides. The project should demonstrate the student's ability to transfer the knowledge and skills acquired in the course to real-world applications.

- **Exams:** There will be three (3) exams during the semester: all to be taken at the scheduled date, time, and location (in Class)/ no makeup allowed! Final exams cannot be rescheduled or missed.
  - **Schedule of Exam and content**

Exam# (%)	Content	Time allowed	Format	Tentative Date
Exam1 (15%)	Topics 1-3	90 minutes	Long Answer Questions	Week 6, Monday in Class from 11:05 am
Exam2 (15%)	Topics 4-6	90 minutes	Long Answer Questions	Week 12, Monday in Class from 11:05 am
Final (20%)	All topics	120 minutes	Long Answer Questions	Week 15, Monday in Class from 11:05 am

Examinations and assignments: There will be multiple assignments and exams during the semester. The assignments and exams will consist of conceptual multiple-choice, problem-solving, and short essay questions. The assignments /exam materials will come from lecture notes, the text, and class discussions. Questions will emphasize understanding and applications of concepts and topics covered in class. Exams will be in person during class time.

Make up and Late Assignment/exam/quiz policy: Generally, make-ups or late submissions will **NOT** be offered or accepted for any missed assignments/exams/quizzes. Late submissions or makeup may be accepted/administered only in extraordinary circumstances such as an excused official university activity, a severe illness, or a dire emergency. However, you must provide comprehensive documentation either before or within a few days of the missed assignment/quiz/exam.

Class conducts and civility code: Everyone in class is expected to follow all rules in the student handbook, as well as common courtesy during classroom lectures and discussions in class and online, including the following:

1. Attendance may be taken at the beginning or the end of the class. A vital part of every student's education is regular attendance of class meetings.
2. It is the students' responsibility to obtain and be able to use the required materials and software for this class.
3. Students should regularly check the Course Calendar, Announcements, and Messages (e-mail) systems in Blackboard.
4. Students should be prepared to turn in their assignments' solutions and must be uploaded to BB by their due date and time. **No late assignments will be accepted, nor are make-up allowed**.
5. If you cannot submit answers to any assignment online and are within the deadline. You can only get credit for your work by emailing the instructor your completed assignment. As possible, take pictures/snapshots of the Issue faced online so it can be addressed.
6. Students must retain copies of all assignments and graded work for verification purposes and provide it to the instructor, if necessary. Keep your own copies of all computer files and e-mails till the final grade is received.
7. Talking while the instructor is lecturing is extremely disruptive and discourteous to the instructor and other students.
8. Using computers or phones (except for a valid urgent need) during class for a purpose not related to class is disruptive. All cell phones and gadgets should be turned OFF and headphones removed.
9. For any questions about the exams and assignments, a student should contact the instructor well in advance of the day they are due, so the instructor may have enough time to provide feedback.
10. All communications will be via e-mail communications to the Texas A&M University e-mail account, and students are expected to use their school provided email account. The instructor will reply to student e-mail messages and voice messages within 2 business days (Monday-Friday).
11. For all classwork, exams, quizzes, etc., if a student is completing it off-campus, they are responsible for the availability of internet connectivity. Extensions will **not** be granted for lack of availability of internet connections.

The submission window may close or be marked late, even if late by one second. Anyone violating these policies may be subject to disciplinary actions.

Broader Use of Generative AI Permitted Within Guidelines: Artificial intelligence (AI) tools, including ChatGPT, are permitted in this course for students who wish to use them. To adhere to our scholarly values, students must cite any AI- generated material that informed their work (this includes in-text citations and/or use of quotations and in your reference list). Using an AI tool to generate content without proper attribution qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Resources +Tentative Schedule

[1] James M. Fiore, **"*Semiconductor Devices: Theory & Application*"**, ISBN-13: 978-1796543537: PDF

i. Laboratory Manual for Semiconductor Devices: Theory & Application, James M. Fiore (OER): PDF

[2] James M. Fiore, (**OALC**) "***Operational Amplifiers & Linear Integrated Circuits***", 3rd Ed., ISBN-13: 978-1796856897: PDF

ii. Laboratory Manual for Operational Amplifiers & Linear Integrated Circuits/3E, James M. Fiore (OER): PDF

Week	Content	Reading	Exam/Assignment
1	Syllabus and Project Discussions. Q+A.		
2	Semiconductor Fundamentals + Diodes: This week we introduce the concepts of Semiconductors, the atomic structure of such materials, and understand the concept of doping to distinguish between the types of semiconductor material. Analyze Fermi levels of different Diodes. Types of Diodes (Zener, rectifier, etc.). Understand device characteristics. Graph and Solve resistor diode circuits for different operational modes.	**Chapter 1 and 2** **Lab 1:** *Experiment 2 &3: Resistive Sensors + Light Emitting Diodes*	
3	This week we solve problems related to Diode Applications like Rectifier Circuits, Regulator circuits using Zener Diodes, outline a complete AC-to-DC power supply with regulation, Solve AC clipper and clamper circuits	**Chapter 3** **Lab 2:** *Experiment 4, 5&6: Light Emitting Diodes + Photodiode + The Zener Diode*	
4	This week we begin with an introduction to BJTs and the CE connection. This includes basic device parameters alpha and beta and other datasheet items, simple DC BJT model, biasing, simple biasing circuits (e.g., base bias), simple base biasing, DC load lines, and saturation limits. LED driver circuits. Voltage divider bias and two-supply emitter bias.	**Chapter 4** **Lab 3:** *Experiment 7, 8&9: The Oscilloscope + Diode Clippers, Clampers, and Half-wave Rectifier*	**Final Project Timeline and Plan Report Due - Monday**
5	We continue with BJT and its bias variations, DC Coupled Circuits, and PNP's	**Lab 4:** *Experiment 10, 11&12: The The Transformer + Full-wave Bridge Rectifier, and The DC Power Supply Project*	**Exam1 Monday: Start of the Class_See Schedule above**
6	We finish biasing and introduce AC models and equivalent circuits. This is where the circuits start to get interesting. Biasing is sort of like learning how to make a car engine idle. Now it's time to start driving. We'll spend the next months looking at small and large signal (i.e., power) amplifier circuits.	**Chapter 5** **Lab 5:** *Experiment 13 &14: Base Bias+ LED Driver Circuits*	**Lab1 Report Due every Wednesday before Class**
7	We work through finding voltage gain, input impedance, and output impedance for a typical voltage divider and dual supply emitter bias circuits. From here, we will also look at the effects of source impedance and loads and perhaps examine a few other biasing types for comparison. Continue with small signal AC analysis, introducing multi-stage schemes and direct-coupled circuits. Emitter Followers and Darlingtons	**Chapter 6. Chapter 7 through section 7.2** **Lab6:** *Experiment 15 &16: Emitter Bias+ Voltage Divider Bias*	**Lab2 Report Due every Wednesday before Class**
8	We introduce large signal amplifiers. Finally, we get to drive loudspeakers, class A amplifiers, including AC load lines, load power, device ratings, efficiency, etc.	**Chapter7** **Lab 7:** *Experiment 17&18: Feedback Biasing+ PNP Transistors*	**Lab3 Report Due every Wednesday before Class**

9	We start BJT class B amplifiers. We pay particular attention to its advantages and disadvantages relative to Class A operation, including circuits utilizing direct coupled drivers and loads.	**Chapter 8** **Lab 8:** *Experiment 19&20. Common Emitter Amplifier+ Swamped Common Emitter Amplifier*	**Lab4Report Due every Wednesday before Class**
10	We begin with Field Effect transistors, first with how JFETs differ from BJTs, and then we launch into JFET biasing.	**Chapter 9**	**Exam2 Monday: Start of the Class_See Schedule above**
11	This week AC amplifiers are introduced.	**Chapter 10** **Lab 9:** *Experiments 22&23. Voltage Follower+ Class A Power Analysis*	**Lab5 Report Due every Wednesday before Class**
12	We finish JFETs and start with MOSFET circuitry, paying attention to the differences between MOSFETs and JFETs.	**Chapter 11** **Lab 10:** *Experiments 24&25. Class B Power Analysis + Power Amp with Driver*	**Lab6 Report Due every Wednesday before Class**
13	FET Applications	**Chapter 12** **Lab 11:** *Experiments 26&27. JFET Bias+ JFET Amplifiers*	**Lab7 Report Due every Wednesday before Class**
14	We begin an introduction to decibels and Bode plots.	**Chapter 13**	
15	**Review + Final Project Report Due (by the end of the week**	**OALC: Chapter 1**	**Exam3 Monday: Start of the Class_See Schedule above**
16	**Final Project Presentation per team**		**During the scheduled Final, each team gets 1hr to present their findings**

IMPORTANT POLICIES AND RESOURCES

Academic Accommodations for Persons with Disabilities: Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Support Services in the Central Academic Building, Suite 210, or at (210) 784-1335 or visit https://www.tamusa.edu/index.html or email us at dss@tamusa.edu. Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Support Services and their instructors as soon as possible.

Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *Tools* section of Blackboard. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu, calling (210) 784-1307, or visiting the Central Academic Building, room 202.

Counseling/Mental Health Resources: As a college student, there may be times when personal stressors interfere with your academic performance and/or negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment, call 210-784-1331 or visit Madla 120. All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services.

Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2'). For more information and self-help resources, please visit www.tamusa.edu/studentcounseling.

Emergency Preparedness: JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff, and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit: https://tamusa.bbcportal.com/. More information about Emergency Operations Plan and the Emergency Action Plan can be found here: https://www.tamusa.edu/about-us/campus-information/safety/university-police-department/documents/emergency-operations-plan.pdf and https://www.tamusa.edu/about-us/campus-information/safety/university-police-department/documents/emergency-action-plan.pdf Download the SafeZone App for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900

Financial Aid and Verification of Attendance: According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. The faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended the first week of class. Any student receiving federal financial aid who does not attend the first week of class will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Writing, Language, and Digital Composing Center: The Writing, Language, and Digital Composing Center supports graduate and undergraduate students in all three colleges as well as faculty and staff. Tutors work with students to develop reading skills, prepare oral presentations, and

plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as eportfolios, class presentations, or other digital multimedia projects. Students can schedule appointments through JagWire under the Student Services tab. Click on "Writing, Language, and Digital Composing Center" to make your appointment. The Center offers face-to-face, synchronous online, and asynchronous digital appointments. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our website at https://bit.ly/WLDCCenter.

Meeting Basic Needs: Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact the Dean of Students (DOS@tamusa.edu) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources they may possess.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance if possible, and in special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the Patriots' Casa in-person room 202, or to contact the Office of Military Affairs with any questions at military.va@tamusa.edu or (210)784-1397.

Religious Observances: Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule: Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

Statement of Harassment and Discrimination: Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equality of opportunity and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, based on race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, gender expression, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university. If you have experienced any form of sex- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such

discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the university's Title IX Coordinator (titleix@tamusa.edu, 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students: Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide reasonable accommodations to pregnant students that would be provided to a student with a temporary medical condition and that is related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status (titleix@tamusa.edu; 210-784-2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources.

Students' Rights and Responsibilities: The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no university rule or procedure that in any way abridges the rights of freedom of speech, expression, petition, and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the university, free from any form of discrimination, including harassment, based on race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, gender identity, gender expression, genetic information, or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.

Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty and staff, and the administration.
2. A student has the responsibility to be fully acquainted with and compliant with the University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, and in the University Catalog.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the Student Code of Conduct.

Important Dates:

January 20	First day of class
March 9-14	Spring Break-No classes
April 3	Study Day – No classes
May 4	Last day of classes
May 5	Study Day – No classes
May 6-12	Final exams

The complete academic calendar is available online:
https://www.tamusa.edu/academics/academic-calendar/index.html

APPENDIX A

Laboratory Report Format and Guidelines

It is essential that students be able to express their ideas and defend their arguments with clarity, detail and subtlety. Similarly, it is important that they can read and critique the ideas and arguments of others in like manner. The creation of lab reports assists in this endeavor.

Unless otherwise specified, all lab exercises require a write-up. All reports should be neat and legible. Standard technical writing style is expected along with proper grammar and spelling. This means that active voice, first person, personal pronouns, and the like should be avoided. For example, don't write "I set the power supply to 6 volts". Instead use "The power supply was set to 6 volts". Reports are an individual endeavor. Although it is perfectly fine to discuss your data and experimental results with your lab partner, the creation of the Report itself is an individual exercise. Plagiarism will not be tolerated. A report should conform to the following outline, in the order given:

1) ***Objective / Hypothesis***. These are statements regarding the items, relationships, characteristics, etc. that you are investigating in this exercise. This is the first part that you write. Indeed, it can be written before you even step foot into the lab. A hypothesis tends to be narrow and focused, but not so focused that it only applies to this exercise. Examples might be "The speed of sound in air increases as the air temperature rises" or "The voltage across a given resistance is directly proportional to the current through it". This section tends to be short.

2) ***Conclusion***. Address the hypothesis was it verified? These are concise statements of fact regarding the circuit action(s) under investigation. Make sure that you have moved from the specific lab situation to the general case. If all works well, these should match nicely with your Objective/Hypothesis section. Under no circumstances should you reach a conclusion that is not supported by your data, even if that conclusion is stated in the text or in lecture. What matters here is what you did and your analysis of it. If there is a discrepancy between your results and theory, state the discrepancy and don't ignore your results. The Conclusion is the final section that you write. It addresses the Objective and is supported by the Discussion. Think of it as an Executive Summary.

3) ***Discussion (AKA Analysis)***. Reduce and analyze your data. Explain circuit action or concepts under investigation. Relate theoretical results to the lab results. Don't just state what happened, but comment on why and its implications. Derive your conclusions from this section. The Discussion is not a rewording of the procedure, however, any deviations from the procedure as given by the lab manual must be noted in this section. Otherwise, the procedure used is assumed to be the same as in the lab manual. The Discussion is the penultimate part that you write and tends to be the longest section. When performing your analysis, always keep in mind that you should be trying to affirm the null hypothesis. The null hypothesis is, in essence, the inverse of the stated hypothesis. You can think of it as the default situation. Using the first example hypothesis above, the null would be "The speed of sound in air is not dependent on-air temperature". In your data tables, you'd be looking to see if the null is true, i.e., that there is no relationship between speed and temperature. In this case, if your data were correct, they would indicate an increase in speed as temperature rose, so the null is not true, and therefor your hypothesis is a valid candidate for describing reality. Having this mindset helps you to avoid cherry picking the data, that is, only seeing the things that confirm what you want and ignoring the rest. Cherry picking is a form of observer bias, is intellectually dishonest, and any good investigation needs to avoid it.

4) ***Final Data Sheet.*** Include all derived and calculated data. Make sure that you include percent deviations for each theory/measurement pair. Use Percent Deviation = (Measured-Theory)/Theory * 100 and include the sign. Include the model and serial numbers of all test equipment. Along with the graphs, this is the second part of the Report that you write. Until this section is completed, it is not possible to complete an analysis and write the Discussion section.

5) ***Graphs,*** Answers to questions at the end of the exercise, Other. All graphs must be properly titled, created using appropriate scales, and identified with labels. It is suggested that graphs be created with a plotting program or a spreadsheet. Alternately, graphs may be created manually but must be drawn using either a straight edge or a French curve (depending on the type of graph) on appropriate graph paper.

   a. You can get details on graphing under Blackboard Tab (LabGraph Sample)
   b. You can see an example lab report under Blackboard Tab (LabReport Sample).

Make sure that you leave sufficient space in the margins and between sections for my comments. 1.5 line spacing is fine. Multi-page reports should print single-sided and must be stapled in the upper left corner. Paper clips, fold-overs, bits of hook-up wire, etc. are not acceptable. Reports are due no later than the start of the next lab period following the date performed. Late reports are reduced by one letter grade for the first half week and two letter grades for the second half week. Reports are not acceptable beyond one week late. Below is the grading standard.

Grade of A: *The Report meets or exceeds the assignment particulars. The Report is neat and professional in appearance, including proper spelling and syntax. The analysis is at the appropriate level and of sufficient detail. Data tables and graphical data are presented in a clear and concise manner. Problem solutions are sufficiently detailed and correct. Diagrams have a professional appearance.*

Grade of B: *The Report is close to the ideal although it suffers from some minor drawbacks which may include some spelling or grammatical errors, analyses which may lack sufficient detail, minor omissions in tabular or graphical data, and the like. In general, the Report is solid but could use refinement or tightening.*

Grade of C: *The Report is serviceable and conveys the major ideas although it may be vague in spots. Spelling and grammatical errors may be more numerous than those found in a grade A or B report. Some gaps in data or omissions in explanations may be seen.*

Grade of D: *Besides typical spelling and grammatical errors, the Report suffers from logical errors such as conclusions which are not supported by laboratory data. Analyses tend to be vague and possibly misleading. Graphs and diagrams are drawn in an unclear manner.*

Grade of F: *The Report exhibits many of the following deficiencies: Excessive spelling and grammatical errors, missing sections such as graphs, tables, and analyses, blatantly incorrect analyses, wayward or incomprehensible data, problem solutions tend to be incorrect or missing, and graphical data or diagrams are presented in a shoddy manner.*