



Texas A&M University-San Antonio
College of Science and Arts

ESET 3105 Near and Far Field Communication LAB

Fall 2025

August 25, 2025 – December 12, 2025

Instructor: Dr. Yuvaraj Munian

Email: ymunian@tamusa.edu

Time: Thursday **2:00 PM – 4:45 PM**

Location: **STEM 243**

Course Mode: **F2F**

Office hours: TR - 9:00 AM-11:00 AM (or
by appointment through email)

Office Location: **STEM 211W**

Credit Hours: 1 Credit (LAB)

Assignments: Blackboard

Course Description:

Experiments on electromagnetic wave characteristics in the near and far field regions to support the learning in ESET 3205. Measurement of wave characteristics, and the impact of antenna design on waves, in the near and far regions.

Through lectures, discussions, and hands-on simulation exercises using MATLAB/Python, students will gain practical experience analyzing simulate fields, propagation, and antenna patterns with the wireless technology and Internet of things. Also to know about the applications related to wireless communication and IoT.

Course Objective:

By the end of this course, students will:

1. The objective of this course is to provide students with hands-on experimental understanding of electromagnetic (EM) wave propagation, antenna design, and measurement techniques in both near-field and far-field regions.
2. Linking these fundamental principles to modern wireless communication and IoT applications.
3. Students will bridge theory with practice by designing, implementing, and evaluating antenna systems, analyzing EM wave behaviors, and
4. Integrating wireless communication modules in real-world IoT scenarios.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. **Explain** the principles of EM wave propagation, near-field and far-field regions, and their importance in antenna design and wireless communication.



2. **Design and construct** simple antennas (e.g., dipole, monopole, patch, loop) and evaluate their performance in laboratory and real environments.
3. **Measure and analyze** key wave characteristics such as radiation pattern, gain, polarization, impedance matching, and path loss using appropriate test instruments and software tools.
4. **Differentiate** between near-field and far-field wave behavior through experimental measurements and compare with theoretical models.
5. **Investigate** the effects of antenna geometry, orientation, and environment on wireless performance.
6. **Apply** IoT devices (e.g., Arduino, ESP32, Raspberry Pi with wireless modules) to demonstrate wireless communication in practical EM scenarios.
7. **Integrate and test** IoT-based wireless links (e.g., Wi-Fi, LoRa, BLE, RFID/NFC) to observe how EM wave characteristics impact communication reliability.
8. **Evaluate** experimental data using simulation and analysis tools (MATLAB, Python, GNU Radio, or CST/HFSS if available) to validate theoretical and practical results.
9. **Demonstrate** the ability to design and conduct EM/antenna experiments, analyze data critically, and present findings in technical reports.
10. **Develop skills** in applying electromagnetic and wireless communication concepts to real-world IoT systems, preparing students for careers in communications engineering and embedded systems.

Reading and Supplementary Materials:

- Ref1: C.A. Balanis – Antenna Theory: Analysis and Design (radiation patterns, near/far field theory).
- Ref2: Simon Haykin – Communication Systems (modulation, channel effects, wireless links).
- Ref3: Andreas F. Molisch, Wireless Communications, 2nd Ed., John Wiley & Sons, 2011. ISBN-10: 0470741872
- Ref4: Theodore Rappaport, Wireless Communications: Principles and Practice, Pearson, 2nd or later editions. ISBN-10: 013042232

Corequisite: ESET 3205.

Taking Notes: Numerous studies, including one from NPR (below), states the importance of note-taking and how it helps students comprehend the subject matter. You are expected to take notes of your own from each session. Supporting documents will be available on BB.

Link: <https://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away>

Prerequisite: MATLAB Programming <https://matlabacademy.mathworks.com/details/matlab-onramp/gettingstarted>. For review of algebra: <https://www.algebrahd.org/>, Khan Academy, virtual office hours, etc.

Contact: Suggest utilizing office hours, and other times, by appointment. All contact should only be via TAMUSA email (ymunian@tamusa.edu). Expect a reply via email within 24-48 business



hours. Usually, any email sent on Friday(s) after 5 pm is answered the upcoming Monday. Upon Technical issues, contact Pearson or IT @ TAMUSA!

NOTE: The subject of the email messages to the instructor must begin with the course name, followed by a brief description of the subject. For example (i) sub: ESET 3302 - Appointment request (ii) sub: FOWC_Wir Comm- Issue with HW3 Q2. If you do not follow this convention, expect delays!

Student Commitment: Students in *Foundations of Wireless Communication* are expected to actively attend and participate in lectures and labs, complete readings and assignments on time, and uphold academic integrity. They should engage in hands-on experiments, contribute responsibly to group work, and communicate professionally with peers and faculty. A commitment to independent learning, openness to feedback, and continuous improvement will be essential to succeed in mastering both the theoretical and practical aspects of wireless communication systems.

A standard is that for every hour a student spends in Class, they are expected to spend a minimum of 3 hours comprehending the material and doing the required assignment.

Total LAB hours = 3 hr./ week (1.5 hr in-person 1.5 hr through Blackboard). Hence expected to spend a minimum of an additional 9 hours doing all the required assignments and comprehension. The total minimum Hours suggested for this course equals 9 Hrs/Week.

Technology Requirements:

Please contact IT (helpdesk@tamusa.edu/ call 210 784 4357) at TAMUSA with any technology-related questions, ASAP. You can keep me in the loop, and if you ask me anything I.T.-related, I will not be of any help; instead will ask you to contact IT.

You should have all the bells and whistles to access class material, perform assignments, take Exams, etc.

Bells and whistles (include but not all)

- A working computer/ Laptop with Windows, Mac, or Chromebook Operating system
- Proper internet connection
- Software to read/ write Word and PDF documents
- Working computer peripherals like a **camera, microphone**, etc.

Course Material + Access:

- **Reading Assignment (RA):** Students are required to read specific sections in the textbook before each lecture, to enable a teaching style somewhat similar to 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!**
- **Lab Report:** Due every Sunday: See Blackboard tabs for Details
- **Final Project:** See below



- Students should be prepared to turn in their solutions by their due date. **No late report will be accepted, nor are make-ups allowed.**

Office hours:

Students need to attend these sessions as scheduled every **Tuesday & Thursday**. No new topic will be discussed during lab hours. We may have a pop Quiz, followed by a discussion, then a Reading Assignment-based critical Questionnaire discussion and Discussion of concepts or problems on the topic at hand that Week or earlier, as needed.

Instructor Policies

Cell Phone Use

Cell phone use is prohibited once Class begins, and they are to be silenced and put away where they are not seen. If a call is expected, take it out of the Class, and anyone that interrupts Class due to a cell phone will be asked to leave.

Laptop Use

Turn off the personal laptop. During lecture time, the laptop is not needed. For project discussions, the personal laptop is allowed only when the instructor gives permission.

Food in Class

Eating or drinking is NOT permitted in the classes. Students with food or drink will be asked to discard them or leave the room.

Tentative Schedule*

<i>Week</i>	<i>Dates</i>	<i>Topics</i>	<i>Details</i>
1	08/28/2025	Network Topologies, Antenna's Basic, Network Scopes – Simulation using Matlab	
2	09/04/2025	2D Maxwell's equation for antenna radiation, wave diffraction – 2D FDTD with Dipole Source	
3	09/11/2025	Large-Scale Path Loss & Coverage Map (Log-Distance Model)	
4	09/18/2025	Short (Hertzian) Dipole: radial decay and separation of terms (Near to Intermediate to Far Field and Angular dependences)	
5	09/25/2025	Angular pattern in Near Field vs Far Field (spherical cuts) – depends on the distance	
6	10/02/2025	Mutual coupling between two small dipoles (distance sweep)	
7	10/09/2025	Inductive (Loop) Near-field coupling (NFC/WPT style) between two co-axial loops	
8	10/16/2025	Wireless Encryption & Security	
9	10/23/2025	Data transmitter and receiver using RPI5	



10	10/30/2025	Fundamental parameters of antenna design	First level Project Discussion
11	11/06/2025	Serial Communication Between the Host and server using Aurdino	Exam 2 (MCQ & Short Answers)
12	11/13/2025	Application using IR transmitter and receiver using LM35 sensor in Rasberry PI- RPI5/ Aurdino UNO	
13	11/20/2025	Secure Wireless Communication	
14	11/27/2025	Thanksgiving Holiday	
15	12/04/2025	LoRA Based IoT Network	DEC 04 Last Day of classes
16	12/06/2025 – 12/12/2025	Final Exams – As per University Schedule	Final Exams must be held only as per Univ Schedule.

** Specific content and Schedule may be revised as deemed necessary by the instructor.*

No make-up Exams, but if you miss an exam, you should contact me by email (**with a valid documented excuse, see below**), at least one week in advance or within 24-hrs of the scheduled exam date for emergency cases. Any missed exam counts as a 0 unless the student has a **valid documented excuse**.

Examples of valid documented excuses are sickness documented with a doctor's note, death in the family documented with a copy of the death notice, and attending university-sponsored events with a Dean's (**Dean of Students**) excuse.

Final Project: Students must prepare a report and present it during Finals week. Final exams cannot be rescheduled or missed. Students will work in teams (2-3 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 size 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.

See Appendix A: Lab Report Format and Guidelines.

See Appendix B: Project Grading Rubric.

Grading Policy

The final course grade for Lecture is calculated as follows:

Attendance – 10%

Lab Report – 30%

LAB Exeercises – 60 %



Course grades are awarded as follows:

A: Over 90.0%; B: 80 ~ 89.99%; C: 70.0 ~ 79.99%; D: 60.0 ~ 69.99%; F: less than 59.99%.

ACADEMIC INTEGRITY:

We take this very seriously!!!

(See <https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/documents/student-handbook.pdf>)

"According to the Student Code of Conduct, the following are violations of Academic misconduct: Cheating, Plagiarism, Multiple Submissions, Collusion, Lying, and Bribery.

Plagiarism, or copying the words of others with the intent of making it look like your own. Whether you use someone else's phrase word for word, or whether you try and change a few words, or even if you just borrow someone else's original idea and don't give them credit, that's unethical. Use your own words whenever possible, give credit to wherever, and put direct quotes inside quotation marks.

Cheating involves trying to trick me or others into thinking you did work that you did not do.

Searching the Internet for homework solutions and copying what you find is considered cheating.

Searching the Internet for help on a topic is okay. For example, suppose a question asks, "What are Newton's Laws of Motion." Typing that phrase into any internet search engine and cutting and pasting the text in the answer box is considered cheating. Typing " What are Newton's Laws of Motion " into any internet search engine, reading a few web pages, and summarizing the information in your own words is not cheating.

o Borrowing a previous student's homework, exams, or solution sets is considered cheating. Likewise, copying your own homework answers or lab reports during an examination is considered cheating.

o Discuss homework with your peers, but give them credit when you learn more from them than what you share

Collusion is defined as working with another person to cheat. This can include copying someone else's answers to an exam or assignment, doing work for another student, buying or otherwise obtaining homework/exam solutions from any source online or offline, or any other instance of multiple people engaging in some form of Cheating or Dishonesty. Working with other students on an assignment is fine as long as everyone contributes, and each student does their work."

Overall, If you have any doubt whatsoever whether a specific action is considered dishonest, please ask me *before* engaging in the activity. There is no need to be embarrassed about asking, and I will not penalize you for asking!

IMPORTANT POLICIES AND RESOURCES

Academic Accommodations for Individuals 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, Disability Support Services is located in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us <https://www.tamusa.edu/Disability-Support-Services/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 as soon as possible.

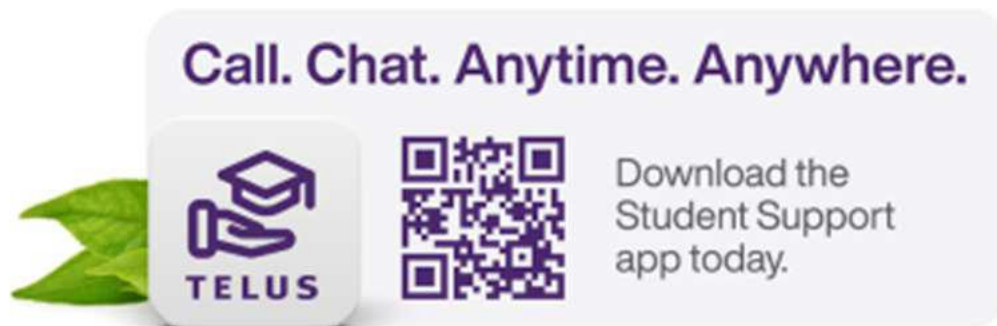
Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the 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 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. For more information on SCC services visit <http://tamusa.edu/studentcounseling>

Crisis support is available 24/7 by calling the SCC at 210-784-1331.

Additionally, the TELUS Student Support App provides a variety of mental health resources to including support for in the moment distress, an anonymous peer-to-peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.



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/emergency-management/>

Download the SafeZone App (<https://safezoneapp.com/>) 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. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended by the published Census Date (the first week of class). Any student receiving federal financial aid who does not attend prior to the published Census Date (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://www.tamusa.edu/academics>.

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 submit a CARE referral (<https://www.tamusa.edu/university-policies/Student-Rights-and-Responsibilities/file-a-report.html>) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources.

Office Hours: All faculty with teaching assignments should include regularly scheduled office hours on each syllabus in addition to "by appointment." Please review your appointment letter for the number of weekly office hours you are expected to set. Regularly scheduled office hours should also be posted outside your office door (where applicable).

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the Patriots' Casa building, 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 with an opportunity to make up any examination, study, or course 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, equal 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 on our campus and within our state, nation, and world. All decisions and actions involving students and employees are to 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, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the University's Civil Rights Officer at 210-784-2061 or titleix@tamusa.edu.

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university as a whole. 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 based on sex, 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, sexual violence, or other related sex-based 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 such reasonable modifications to pregnant students as would be provided to a student with temporary medical condition that are 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.

Young Jaguars: can support parenting students with daycare who meet this criteria: Must be enrolled in classes at TAMUSA in the current semester. Must be Pell eligible or a single parent. They serve children ages 3 to 12-years-old. Children must be enrolled in Pre-K-3 through 6th grade.

youngjaguars@tamusa.edu (210) 784-2636

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 administrative rule 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, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, gender identity, gender expression, and pregnancy/parenting 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 students' 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 administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, and University Catalog, and to comply with them, as well as with federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide a safe environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notifications.

We expect that students will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation, or disability. Conduct that infringes on the rights of another individual will not be tolerated.



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 (<https://www.tamusa.edu/university-policies/student-rights-andresponsibilities/documents/Student-Handbook-2022-23.pdf>) or visit the resources available in the OSRR website (<https://www.tamusa.edu/university-policies/student-rights-andresponsibilities/academicintegrity.html>).

Insert ONE of the AI policy options listed below in your syllabi – Select the one you believe is most appropriate for your course.

Option 1 - No Use of Generative AI Permitted

[Insert Course Number] assumes that all work submitted by students will be generated by the students themselves, working individually or in groups. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments and/or using artificial intelligence (AI) tools like ChatGPT. Use of any AI-generated content in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Option 2 – Use of Generative AI Permitted Under Some Circumstances or With Explicit Permission

There are situations and contexts within this course where you may be asked to use artificial intelligence (AI) tools to explore how they can be used. Outside of those circumstances, you should not use AI tools to generate content (text, video, audio, images) that will end up in any student work (assignments, activities, discussion responses, etc.) that is part of your evaluation in this course. Any student work submitted using AI tools should clearly indicate with attribution what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, students should reach out to their instructor for clarification before submitting work for grading. Use of AI-generated content without the instructor's permission and/or proper attribution in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Option 3 – Broader Use of Generative AI Permitted Within Guidelines

Use of artificial intelligence (AI) tools, including ChatGPT, is 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.

Option 4 – Customized Policy Generative AI Policy



Faculty may create a customized policy that is unique for a specific course with consultation from the department chair. Faculty are encouraged to view Texas A&M University's Generative AI Syllabus Statement Considerations when preparing a customized AI policy

NOTE: Guidance for how to cite AI-generators, like ChatGPT, can be found here <https://apastyle.apa.org/blog/how-to-cite-chatgpt>

Option 2/Option 4 will be used for the ESET 3102 Foundation of Wireless Communication I Lab

Important Dates: Fall 2025 Regular 16-Week Session

August 25	First day of class
September 1	Labor Day Holiday – No Classes
September 10	Census Date
November 14	Last Day to drop with an automatic "W"
November 25	Last day to withdraw from the University
November 26	Study Day – No classes
November 27-29	Thanksgiving Holiday – No classes
December 4	Last day of classes
December 5	Study Day – No classes
December 6-12	Final exams
December 16	Commencement

Academic Calendar:

<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 particular exercise. This is the first part that you write. Indeed, it can be written before you even step foot into the lab. An hypothesis tends to be narrow and focused, but not so focused that it only applies to this particular 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 fairly 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 therefore 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 $\text{Percent Deviation} = (\text{Measured} - \text{Theory}) / \text{Theory} * 100$, 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.

- You can get details on graphing under Blackboard Tab(LabGraph Sample)
- 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 be printed 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 late 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.

APPENDIX B

Final Project Grading Rubric (If Needed)

Rubric for Final Project

Criteria	Excellent (Full Points)	Good (Mid Range)	Fair (Low Range)	Poor (Minimal/No Points)	Total
Problem Definition & Objectives	Clear, well-motivated problem; precise measurable objectives (9–10)	Problem stated; objectives somewhat specific (7–8)	Vague problem; general/incomplete objectives (5–6)	No clear problem or objectives (0–4)	10%
Background & Literature Review	Strong connection to wireless theory; references to standards/research (13–15)	Some theoretical grounding; missing depth (10–12)	Minimal review; weak connection to goals (7–9)	No background or incorrect understanding (0–6)	15%
Technical Approach & Methodology	Well-structured; correct use of models (channel, modulation, BER, etc.); justified methods (22–25)	Sound methodology; minor flaws (18–21)	Limited methodology; unclear justification (13–17)	Weak/incorrect methodology (0–12)	25%
Implementation / Simulation / Experimentation	Successful MATLAB/Python/NS-3/SDR	Working implementation; minor errors (15–17)	Partial/unclear implementation (10–14)	No implementation or incorrect execution (0–9)	20%



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	implementation; well-documented (18–20)				
Results & Analysis	Clear results with graphs/metrics; compared to theory/benchmarks (18–20)	Results presented; limited analysis (15–17)	Superficial/incomplete results (10–14)	No results or misinterpreted data (0–9)	20%
Presentation & Report	Well-structured; clear writing; professional figures; strong oral presentation (9–10)	Understandable but lacks polish/organization (7–8)	Disorganized; unclear figures/writing (5–6)	Incomplete/poor presentation (0–4)	10%