

COURSE ASSESSMENT REPORT

**ROY G. PERRY COLLEGE OF ENGINEERING
ELECTRICAL AND COMPUTER ENGINEERING
DEPARTMENT
PRAIRIE VIEW A&M UNIVERSITY**

ASSESSMENT REPORT COVER PAGE

ELEG 3302-P01 SIGNALS & SYSTEMS

FALL 2021 SEMESTER

NAME OF INSTRUCTOR: Dr. John O. Attia

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 - 5.1 On completion of course the student should have demonstrated, an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (outcome 1).



SYLLABUS

ELEG 3302-P01 SIGNALS AND SYSTEMS FALL 2021

General Course Information

Information Item	Information
Instructor:	Dr. John O. Attia
Section # and CRN:	ELEG 3302-P01 and CRN: 17840
Office Location:	New Engineering Building, Room NENR 318
Office Phone:	(936) 261 9916
Email Address:	joattia@pvamu.edu
Office Hours:	M 10:00 a.m. to 12:00 noon, M 1:00 p.m. to 3:00 p.m. and T 11:00 a.m. to 1:00 p.m.
Mode of Instruction:	In Person face-to-face
Course Location:	New Engineering Building, Room NENR 221
Class Days & Times:	TR 7:00a.m. to 8:20 a.m..
Catalog Description:	<i>ELEG 3302 Signals and Systems: 3 semester hours.</i> Basic discrete and continuous time signals, properties of systems, linear time invariant systems, Fourier analysis, z-transformers, LaPlace Transform.
Prerequisites:	ELEG 3301 Network Theory II
Co-requisites:	None
Required Text(s):	M.N.O. Sadiku and W.H. Ali, "Signals and Systems: A Primer with MATLAB," CRC Press, Boca Raton, FL 2016, ISBN: 978-1-4822-6151-6.
Recommended Text(s):	Hwei P. Hsu, "Signals and Systems: Schaum Outline", McGraw Hill, 4th Edition, 2020.

Student Learning Outcomes:

Upon successful completion of this course, students will be able to:	Program Learning Outcome Alignment	Core Curriculum Outcome Alignment
1. Be able to differentiate between continuous-time and discrete time signals	ABET Criterion 3, student outcome 1	None
2. Be able to apply various signal transformation processes	Knowledge of the field	None
3. Be able to describe properties of systems with emphasis on those of linear time-invariant systems	Knowledge of the field	None
4. Be able to perform convolution for continuous-time and discrete time systems	Knowledge of the field	None
5. Be able to use to obtain the Fourier series expansion of periodic signals	Knowledge of the field	None
6. Be able to apply Fourier transform to obtain frequency content of signals	Knowledge of the field	None
7. Be able to apply Laplace transform to obtain the response of linear systems with known inputs	ABET Criterion 3, student outcome 1	None

8. Be able to apply Z-transform in solving problems in discrete time systems	Knowledge of the field	None
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ABET PROGRAM OUTCOMES (ABET Criterion 3, Student Outcome 1)

On completion of course the student should have demonstrated an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

Method of Determining Final Course Grade

Course Grade Requirement	Value	Weight
1. Attendance & Participation	100	5%
2. Homework Assignments (Not graded, for Practice Only) ¹	100	5%
3. Computer Application Problems	100	10%
4. Class Project	100	10%
5. Exam #1 , Exam #2 and Exam #3	300	48%
6. Final Exam	100	22%
Total:	800	100%

¹. Homework assignments will be collected but not graded. They should be considered as practice problems that will help you to prepare for the four exams.

Grading Criteria and Conversion:

RANGE	LETTER GRADE
88 % to 100 %	A
75 % to 87 %	B
62 % to 74 %	C
49 % to 61 %	D
0 % to 48 %	F

Detailed Description of Major Assignments:

Assignment Title	Description
1. Computer Application Problems	There will computer applications problems that will involve the use of the MATLAB for solving Signal and System problems.
2. Class Project	You will be asked to complete a project with the goal of solving a complex engineering problem. The report should include, among other things, (i) problem identification, (ii) problem formulation, (iii) solution of the problem by applying the principles of engineering, science and mathematics, and (iv) evaluation and interpretation of resulting solution.

ASSIGNMENTS: Problems on the topics discussed in class will be assigned. Assignments should be completed and handed in on time. The completed homework assignments will not be graded. It is important to complete the homework, if you want to do well in the quizzes and exams. Late homework will not be accepted. All homework should be handed in by the end of the class period of the day they are due.

Course Procedures or Additional Instructor Policies

Taskstream

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. One of your assignments may be required to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. If applicable, more information will be provided during the semester by your department, but for general information, you can visit Taskstream via the link in eCourses.

Semester Calendar

DATE	LECTURE	SECTIONS OF TEXTBOOK	TEST/EXAM
8/24/21 to 9/2/21	Introduction to Linear Systems	Chapter 1	
9/7/21 to 9/14/21	Convolution	Chapter 2	
9/16/21			Exam #1
9/21/21 to 9/30/21	Laplace Transform	Chapter 3	
10/5/21 to 10/12/21	Fourier Series	Chapter 4	
10/14/21			Exam #2
10/19/21 to 10/26/21	Fourier Transform	Chapter 5	
10/28/21 to 11/2/21	Discrete Fourier Transform	Chapter 6	
11/4/21			Exam #3
11/9/21 to 11/11/21	Discrete Fourier Transform	Chapter 6	
11/16/21 and 11/23/21	Z- transform	Chapter 7	
11/25/21 to 11/27/21	Thanksgiving Holidays		
11/30/21	Review		
12/2/21 –12/8/21	Final Exam - Final Examination Period		
12/11/21	Commencement		

Student Support and Success

John B. Coleman Library

The John B. Coleman Library's mission is to enhance the scholarly pursuit of knowledge, to foster intellectual curiosity, and to promote life-long learning and research through our innovative services, resources, and cultural programs, which support the Prairie View A&M University's global mission of teaching, service, and research. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. Website: <https://www.pvamu.edu/library/>; Phone: 936-261-1500

Academic Advising Services

Academic Advising Services offers students a variety of services that contributes to student success and leads towards graduation. We assist students with understanding university policies and procedures that affect academic progress. We support the early alert program to help students get connected to success early in the semester. We help refer students to the appropriate academic support services when they are unsure of the best resource for their needs. Faculty advisors support some students in their respective colleges. Your faculty advisor can be identified in PantherTracks. Advisors with Academic Advising Services are available to all students. We are located across campus. Find your advisor's location by academic major at www.pvamu.edu/advising. Phone: 936-261-5911

The University Tutoring Center

The University Tutoring Center (UTC) offers free tutoring and academic support to all registered PVAMU students. The mission of the UTC is to help provide a solid academic foundation that enables students to become confident, capable, independent learners. Competent and caring staff and peer tutors guide students in identifying, acquiring, and enhancing the knowledge, skills, and attitudes needed to reach their desired goals. Tutoring and academic support are offered face-to-face in the UTC, in virtual face-to-face sessions (<https://www.pvamu.edu/student-success/sass/university-tutoring-center/>), and through online sessions (<https://www.pvamu.edu/pvplace/>). Other support services available for students include Supplemental Instruction, Study Break, Academic Success Workshops, and Algebra Study Jam. Location: J. B. Coleman Library, Rm. 307; Phone: 936-261-1561; Email: pvtutoring@pvamu.edu; Website: <https://www.pvamu.edu/student-success/sass/university-tutoring-center/>

Writing Center

The Writing Center provides well-trained peer tutors to assist students with writing assignments at any stage of the writing process. Tutors help students with various writing tasks from understanding assignments, brainstorming, drafting, revising, editing, researching, and integrating sources. Students have free access to Grammarly online writing assistance. Grammarly is an automated proofreading and plagiarism detection tool. Students must register for Grammarly by using their student email address. In addition, students have access to face-to-face and virtual tutoring services either asynchronously via email or synchronously via Zoom. Location: J. B. Coleman Library, Rm. 209; Phone: 936-261-3724; Website: <https://www.pvamu.edu/student-success/writing-center/>; Grammarly Registration: <https://www.grammarly.com/enterprise/signup>

Academic Early Alert

Academic Early Alert is a proactive system of communication and collaboration between faculty, academic advisors, and PVAMU students that is designed to support student success by promptly identifying issues and allowing for intervention. Academic Early Alerts help students by providing a central location to schedule advising appointments, view advisor contact information, and request assistance. Students who recognize that they have a problem that is negatively affecting their academic performance or ability to continue school may self-refer an Academic Early Alert. To do so, students will log in to PV Place and click on Academic Early Alert on the left sidebar. Phone: 936-261-5902; Website: <https://www.pvamu.edu/student-success/early-alert/>

Student Counseling Services

The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas and assists students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially

and in accordance with Texas State Law. Location: Hobart Taylor, 2nd floor; Phone: 936-261-3564; Website: <https://www.pvamu.edu/healthservices/student-counseling-services/>

Office of Testing Services

Testing Services serves to create opportunities by offering a suite of exams that aid in the students' academic and professional success. Currently, we administer entrance (HESI A2), college readiness (TSI assessment), Prior Learning (CLEP, DSST), and proctored exams. Location: Wilhelmina Delco, 3rd Floor, Rm. 305; Phone: 936-261-3627; Email: aetesting@pvamu.edu; Website: www.pvamu.edu/testing

Office of Diagnostic Testing and Disability Services

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, contact the Office of Disability Services. As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hard and software, adapted furniture, proctoring non-standardized test administrations, ASL interpreters, ALDs, digital recorders, Livescribe, and a comprehensive referral network across campus and the broader community. Location: Hobart Taylor, Rm. 1D128; Phone: 936-261-3583; Website: <https://www.pvamu.edu/disabilityservices/>

Center for Instructional Innovation and Technology Services (CIITS)

Distance Learning, also referred to as Distance Education, is the employment of alternative instructional delivery methods to extend programs and services to persons unable to attend college in the traditional manner. The Center for Instructional Innovation and Technology Services (CIITS) supports student learning through online, hybrid, web-assist, and 2-way video course delivery. For more details and contact information, visit:

<https://www.pvamu.edu/dlearning/distance-learning-2-2/students-2/>; Phone: 936-261-3283

Veteran Affairs

Veterans Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall, Rm. 102; Phone: 936-261-3563; Website: <https://www.pvamu.edu/sa/departments/veteranaffairs/>

Office for Student Engagement

The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development, and campus governance. Location: Memorial Student Center, Rm. 221; Phone: 936-261-1340; Website: <https://www.pvamu.edu/studentengagement/>

Career Services

Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Anderson Hall, 2nd floor; Phone: 936-261-3570; Website: <https://www.pvamu.edu/careerservices/>

University Rules and Procedures

Academic Misconduct

Academic dishonesty is defined as any form of cheating or dishonesty that has the effect or intent of interfering with any academic exercise or fair evaluation of a student's performance. The college faculty can provide additional information, particularly related to a specific course, laboratory, or assignment.

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with the *University Administrative Guidelines on Academic Integrity*, which can be found on the [Academic Integrity webpage](#). Students who engage in academic misconduct are subject to university disciplinary procedures. As listed in the *University Administrative Guidelines on Academic Integrity*, the University Online Catalog, and the Student Code of Conduct, the following are examples of prohibited conduct. This list is not designed to be all-inclusive or exhaustive. In addition to academic sanctions, any student found to have committed academic misconduct that is also a violation of criminal law may also be subject to disciplinary review and action by the Office of Student Conduct (as outlined in the Student Code of Conduct).

Forms of Academic Dishonesty:

1. **Cheating**: Deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not learned, giving or receiving aid unauthorized by the instructor on assignments or examinations. Examples: unauthorized use of notes for a test; using a "cheat sheet" on a quiz or exam; any alteration made on a graded test or exam which is then resubmitted to the teacher;
2. **Plagiarism**: Careless or deliberate use of the work or the ideas of another; representation of another's work, words, ideas, or data as your own without permission or appropriate acknowledgment. Examples: copying another's paper or answers, failure to identify information or essays from the internet and submitting or representing it as your own; submitting an assignment which has been partially or wholly done by another and claiming it as yours; not properly acknowledging a source which has been summarized or paraphrased in your work; failure to acknowledge the use of another's words with quotation marks;
3. **Collusion**: When more than one student or person contributes to a piece of work that is submitted as the work of an individual;
4. **Conspiracy**: Agreeing with one or more persons to commit an act of academic/scholastic dishonesty; and
5. **Multiple Submission**: Submission of work from one course to satisfy a requirement in another course without explicit permission. Example: using a paper prepared and graded for credit in one course to fulfill a requirement and receive credit in a different course.

Nonacademic Misconduct

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. The Office of Student Conduct will adjudicate such incidents under nonacademic procedures.

Sexual Misconduct

Sexual harassment of students and employees at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating the university's sexual harassment policy will be subject to disciplinary action. In accordance with the Texas A&M University System guidelines, your instructor is obligated to report to the Office of Title IX Compliance (titleixteam@pvamu.edu) any instance of sexual misconduct involving a student, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which the instructor becomes aware during this course through writing, discussion, or personal disclosure. The faculty and staff of PVAMU actively strive to provide a learning, working, and living environment that promotes respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like assistance or have questions, they may contact the Title IX Coordinator at 936-261-2144 or titleixteam@pvamu.edu. More information can be found at www.pvamu.edu/titleix, including confidential resources available on campus.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related conditions, or

parenting (reasonably immediate postpartum period) are encouraged to contact Student Disability Services or the Dean of Students' Office for additional information and to request accommodations.

Non-Discrimination Statement

Prairie View A&M University does not discriminate on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or gender identity in its programs and activities. The University is committed to supporting students and complying with The Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of discrimination or harassment, we encourage you to report it. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Director of Equal Opportunity & Diversity has been designated to handle inquiries regarding the non-discrimination policies and can be reached at Harrington Science Building, Suite 109 or by phone at 936-261-1744 or 1792.

Class Attendance Policy (See the University Online Catalog for Full Attendance Policy)

Prairie View A&M University requires regular class attendance. Attending all classes supports the full academic development of each learner, whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or the internet. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in the assignment of a grade of "F." Absences are accumulated beginning with the first day of class during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rest with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the University Online Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Technical Considerations

Minimum Recommended Hardware and Software:

- Intel PC or Laptop with Windows 10 or later version; Mac with OS High Sierra*
- Smartphone or iPad/Tablet with Wi-Fi*
- High-speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, or Firefox

Note: Be sure to enable Java & pop-ups in the Web browser preferences

* Smartphones, Google Chrome books, and Android tablets may not be supported. iPads are the only tablets supported.

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving email
- A working knowledge of the Internet
- Microsoft Word (or a program convertible to Word)
- Acrobat PDF Reader
- Windows or Mac OS
- Video conferencing software

Netiquette (online etiquette)

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussion boards. Foul or abusive language will not be tolerated. Do not use ALL CAPS for communicating to others AS IT CAN BE INTERPRETED AS YELLING. Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you." Limit and possibly avoid the use of emoticons. Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post, and the message might be taken seriously or sound offensive.

Video Conferencing Etiquette

When using Zoom, WebEx, or other video conferencing tools, confirm the visible area is tidy, clear of background clutter, inappropriate or offensive posters, and other distractions. Ensure you dress appropriately and avoid using high traffic or noisy areas. Stay muted when you are not speaking and avoid eating/drinking during the session. Before the class session begins, test audio, video, and lighting to alleviate technology issues.

Technical Support

Students should go to <https://mypassword.pvamu.edu/> if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Center for Instructional Innovation and Technology Services at 936-261-3283 or email ciits@pvamu.edu.

Communication Expectations and Standards

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can occur in a seminar fashion. The use of the discussion board will accomplish this. The instructor will determine the exact use of discussion boards.

It is strongly suggested that students type their discussion postings in a word processing application such as Word and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, copy and paste to the discussion board.

COVID-19 Campus Safety Measures [NOTE: Delete this section when the COVID-19 pandemic is over]

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, PVAMU has adopted policies and practices to limit virus transmission.

- **Self-monitoring** - Students should follow CDC recommendations for self-monitoring. Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely and should not participate in face-to-face instruction.
- **Face Coverings** - Face coverings (cloth face covering, surgical mask, etc.) are recommended in classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource, and support offices, and outdoor spaces where 6 feet of physical distancing is challenging to maintain reliably.
- **Physical Distancing** - Physical distancing should be maintained between students, instructors, and others in course and course-related activities where possible.
- **Personal Illness and Quarantine** - Students required to quarantine are to participate in courses and course-related activities remotely and must not attend face-to-face course activities. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work

unless they have symptoms that are too severe to participate in course activities. Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence. To receive an excused absence, students must provide appropriate documentation to the Office for Student Conduct, studentconduct@pvamu.edu.

Detailed Course Syllabus
(Distributed to Students at the beginning of the Semester)

End of Semester Course Assessment Report

This summary contains the following Information

1. Performance Statistics

- Total number of students in class
- The class average performance (**stated as %**) in each course outcome assessed in this class and the **two previous times course was assessed**.
- The acceptable class average for the class in each outcome area as set by your Department. **You cannot use any number of your choice**
- Percentage of students who scored below the expected average in each outcome.

2. Implementation Summary

- Brief summary of plans implemented during the semester based on last assessment report

3. Perceived Problems

- Instructor's critical **evaluation** of perceived problems that affected students' performance. **Realistic problems should be identified throughout the semester and summarized in this section of the report.**

4. New Plans for Addressing Problems

- Instructor's plans for addressing the perceived problems the next time the class is taught. **These should be specific enough for another instructor to implement. Most of these should be things that, you, the instructor can implement to help students to improve. Be creative.**

5. Overall Trend over last three assessment periods

- Instructors' summary of overall performance trend for each outcome measured over the last three periods.

5. Were Expectations Met?

- Answer **YES** if the **class average was above the expected average** and the **stated percentage of students** scored at or above the expected average, else answer NO.

[illegible]

[illegible]

**Grade Sheet Showing
Student and Class Performance in Outcomes
The computed semester average in each outcome
as stated in the Assessment report are
highlighted in boldface**

(ELECTRICAL ENGINEERING MAJORS)
SCORES FOR STUDENT OUTCOME #1

Number	Student	Major	Outcome 1.1	Outcome 1.2	Outcome 1	Percentage above 70%
1		ELEG	100	88	93	1
2		ELEG	100	88	93	1
3		ELEG	95	86	90	1
4		ELEG	100	98	98	1
5		ELEG	100	98	98	1
6		ELEG	95	86	90	1
7		ELEG	75	56	64	0
	Average		95	86	89	86

SIGNALS AND SYSTEMS – ELEG 3302-P01 / FALL 2021
(COMPUTER ENGINEERING MAJORS)
SCORES FOR STUDENT OUTCOME #1

Number	Student	Major	Outcome 1.1	Outcome 1.2	Outcome 1	Percentage above 70%
1		CPEG	100	70	83	1
2		CPEG	75	56	64	0
3		CPEG	100	70	83	1
	Average		92	65	77	67

**OUTCOME SPECIFIC ASSIGNMENTS
USED TO ASSESS OUTCOMES**

**(Provide assignment used to specifically measure each
outcome and justify the suitability of the assignments
for the outcome being measured)**

ASSIGNMENT FOR OUTCOME 1

Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.

**ELECTRICAL AND COMPUTER ENGINEERING
DEPARTMENT
OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET
SIGNALS AND SYSTEMS
FALL 2021**

Instructor: Dr. John O. Attia

Title of Assignment

Modeling an Active Network

Outcome Measured Using this Assignment

Outcome 1

Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.

Check the complex engineering problem characteristics related to this assignment

Ability to solve complex engineering problems	
Assignment Problem	
	Involves wide-ranging or conflicting technique issues
X	Has on obvious solution
	Addresses problems not encompassed by current standards and codes
	Includes diverse groups of stakeholders
X	Includes many component parts or sub-problems
	Involves multiple disciplines
	Has significant consequences in a range of contexts.
Assignment problem involves the application of the principles of	
X	Engineering
	Science
X	Mathematics

Brief justification of why this assignment is suitable for this outcome

Students are expected to determine possible circuit that can be used to mode an active network consisting of two operational amplifiers and passive elements. The students are expected to (a) use MultiSim to determine the frequency response of the active network; (b) obtain an equivalent passive network, with its element values, that will have the same frequency response as active network, (c) use MultiSim to determine the frequency response of the passive network; (d) compare the center frequencies and bandwidths of the frequency responses of the active and passive networks; (e) determine the transfer function equation of the passive network, (f) given a particular output signal, the students are to find the input signal of the passive network.

PRAIRIE VIEW A&M UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
ELEG 3302-P01 – FALL 2021
CLASS PROJECT: MODELING AN ACTIVE NETWORK

In this project, a team consisting of about two students must determine a possible circuit that can be used to model an active network shown figure 1.

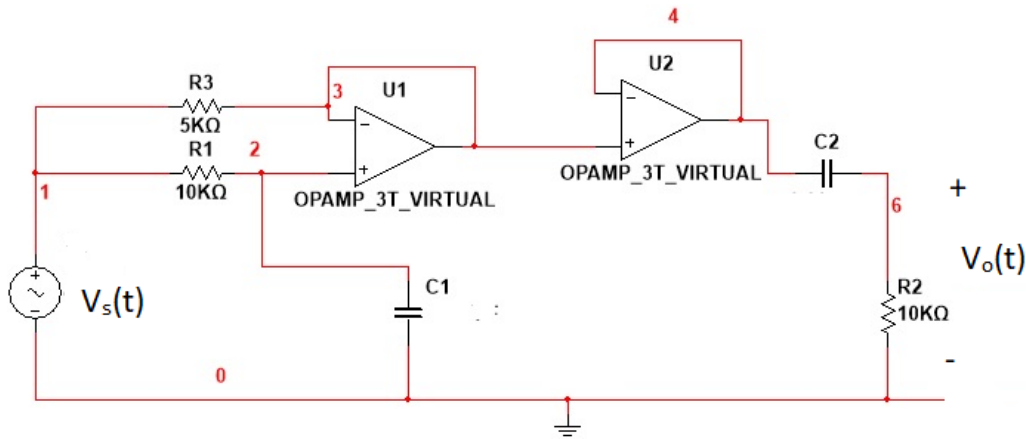


Figure 1: Active Network

For groups 1 to 5, the component values are shown in Table 1:

Table 1: Component Values and Frequency (freq_X)

Group	R1	C1	R2	C2	R3	freq_X (Hz)
1	1.00E+04	5.00E-07	1.00E+04	5.00E-07	5.00E+03	5.00E+01
2	1.00E+04	5.00E-08	1.00E+04	5.00E-08	5.00E+03	5.00E+02
3	1.00E+04	5.00E-09	1.00E+04	5.00E-09	5.00E+03	5.00E+03
4	1.00E+04	5.00E-10	1.00E+04	5.00E-10	5.00E+03	5.00E+04
5	1.00E+04	5.00E-11	1.00E+04	5.00E-11	5.00E+03	5.00E+05

- Use MultiSim to determine the frequency response of the active network
- Obtain an equivalent passive network, with its element values, that will have the same frequency response as that obtained in part (a).
- Use MultiSim to determine the frequency response of the passive network obtained in part (b)
- Compare the center frequencies and bandwidths of the frequency responses obtained in parts (a) and (c).
- Determine the transfer function equation of the passive network obtained in part (b)
- Given that the output signal is $v_o(t) = 0.1 \cos(2\pi * \text{freq_X} * t)$, find the input signal $v_s(t)$ of the passive network obtained in part (b).

Content of Your Report

Your report must have the following sections:

- (i) Title of project
- (ii) Problem Statement
- (iii) Frequency Response of the Active Filter Network – use MultiSim to determine the frequency response of the active filter network
- (iv) Equivalent Passive Network - obtaining an equivalent passive network, with its element values, that will have the same frequency response as the active network.
- (v) Frequency Response of Equivalent Passive Network - use MultiSim to determine the frequency response of the passive network
- (vi) Comparison Between Frequency Responses of Active and Passive Networks - compare the center frequencies and bandwidths of the frequency responses obtained for the active and passive networks.
- (vii) Transfer Function of the Passive Network - determine the transfer function of the passive network
- (viii) An Application of the Model – determine the input signal $v_s(t)$ of the passive network if the output signal is given as $v_o(t) = 0.1 \cos(2\pi * freq_X * t)$
- (ix) Discussion of Results – discuss the results of this project
- (x) Conclusions - provide the major conclusions of this project

Note: The report should be carefully written, with proper grammar and spelling. You are advised to make use of well-designed tables and graphs to present your design and results. Each figure and table should have a numbered caption, and they should be referenced in the text of the report.

Indicate in your report the amount of work done by each member in your group. Signatures of the members in your group indicating they participated actively in the project are required.

Submission (Two Submissions)

- (i) Each team member must submit a copy of the team project to Ecourse on **Thursday, November 18, 2021 by 11:59 p.m.**
- (ii) Each member of a team must submit a softcopy of the project to Taskstream: ELEG 3302-P01, Assignment (outcome 1) on **Thursday, November 18, 2021 by 11:59 p.m.**

PRAIRIE VIEW A&M UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
ELEG 3302 SIGNALS AND SYSTEMS
RUBRICS FOR GRADING SOLVING COMPLEX ENGINEERING PROBLEM
FALL 2021

GROUP NUMBER: _____

GROUP MEMBERS: 1. _____
 2. _____

RUBRICS FOR GRADING DESIGN PROJECT

ITEMS	POINTS ACHIEVED	MAXIMUM POINTS
1. Identify and Formulate Complex Engineering Problem by Applying the Principles of Engineering (Student Outcome 1.1) Obtain passive circuit characteristics that models the active circuit.		20
2. Identify and Formulate Complex Engineering Problem by Applying the Principles of Engineering (Student Outcome 1.1) Identify element values of the passive circuit for modeling the active circuit.		20
3. Solve Engineering Problem by Using MultiSim (Student Outcome 1.2) Use MultiSim to determine the frequency response of the identified passive network.		10
4. Solve Engineering Problem – Evaluate and Interpret Results (Student Outcome 1.2) Compare the magnitude responses obtained for both the active and passive networks.		10
5. Solve Engineering Problem – Determine Transfer Function of Passive Network (Student Outcome 1.2) Use appropriate equation to determine transfer function of the passive network.		10
6. Solve Engineering Problem – Determine the Input Signal Given an Output Signal (Student Outcome 1.2) Use an appropriate method to determine the input signal for a given output signal.		10
7. Discussion of Results and Conclusions (Student Outcome 1.2) Draw conclusions using appropriate engineering judgement.		10
8. General Write-up of Report (i) Grammar and Adequacy of plots and figures, (ii) Proper labeling of graphs and tables, (iii) Proper references to graphs and tables, (iv) Clear and meaningful sentences, and (v) Organized report		10
9. Composite Report Grade		100
10. Grade for ABET Student Outcome 1.1 (Items #1, 2)		40
11. Grade for ABET Student Outcome 1.1 (Normalized to 100%)		100
12. Grade for ABET Student Outcome 1.2 (Items # 3, 4, 5, 6 and 7)		50
13. Grade for ABET Student Outcome 1.2 (Normalized to 100%)		100
14. Grade for ABET Student Outcome 1 (Items #1, 2, 3, 4, 5, 6, and 7)		90
15. Grade for ABET Student Outcome 1 (Normalized to 100%)		100