**Laboratory Report Cover Sheet
DeVry University
College of Engineering and Information Sciences**

**Course Number:** ECET350

**Professor:**

**Laboratory Number:** 2

**Laboratory Title:** Signal Sampling and Reconstruction

**Submittal Date:** Click here to enter a date.

**Objectives:**

* Use principles of signal sampling and reconstruction to construct an electronic circuit to sample, hold, and reconstruct the signal.
* Apply the antialiasing and anti-imaging filters to perform proper simulation of signal sampling and reconstruction.

**Results: Summarize your results in the context of your objectives.**

**Conclusions: What can you conclude about this lab based on your results?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Student:** |  |  |  |  |  |
|  | Name |  | Program |  | Signature |

**Step 1: Antialiasing and Anti-imaging Filter Measurements, Graphs, and Calculations**

1. Determine the cutoff frequency of the antialiasing and anti-imaging active filters used in the circuit.

2. Frequency of the signal to be sampled

3. Sampling period

4. Sampling frequency

5. Is the sampling theorem satisfied? Justify your answer.

6. Predict the frequencies in the range from 0 Hz to 10 kHz of the sampled signals according to the sampling theorem.

**Step 2: Antialiasing and Anti-imaging Spectrum Analyzer Screen Capture**

Paste the screen capture of your simulation spectrum analyzer in the space provided.

**Measured and Recorded Values**

Major components: (approximately)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency, Hz |  |  |  |  |
| Peak Voltage, mV |  |  |  |  |

Table 1

**Step 3: Signal Reconstruction Spectrum Analyzer Screen Capture, Measurement, and Questions**

Paste your screen capture in the space provided.

**Step 4: Antialiasing Analyzer Screen Capture, Measurement, and Questions**

Paste the screen capture of your simulation spectrum analyzer in the space provided.

**Screen Capture of Anti-imaging Filter Spectrum Analyzer**

Paste the screen capture of your simulation spectrum analyzer in the space provided.

**Step 5: Aliasing Simulation Analyzer Screen Capture, Measurement, and Questions**

Paste the screen capture of your simulation spectrum analyzer in the space provided.

**Graded Signal Sampling and Reconstruction Analysis Questions**

**From the first spectrum analyzer captured in Step 3:**

1. What is the expected frequency after signal reconstruction?

2. What is the frequency measured from the spectrum?

3. Did you fully recover the original signal?

**From the first spectrum analyzer captured in Step 4:**

4. Frequency of the signal to be sampled:

5. Sampling frequency:

6. Is the sampling theorem satisfied?

7. List frequencies of the sampled signals in the range from 0 to 10 kHz**:**

**From the second spectrum analyzer captured in Step 4:**

8. Did you fully recover the original signal?

9. List the aliasing frequencies, if any.

**From the spectrum analyzer captured in Step 5:**

10. Frequency of the signal to be sampled:

11. Sampling frequency:

12. Is the sampling theorem satisfied?

13. Can you find frequencies of the sampled signals for the range from 0 to 10 kHz?

***Grade:***

|  |  |  |
| --- | --- | --- |
| **Deliverable** | **Points Available** | **Points Achieved** |
| **Data Measurements** | 10 |  |
| **Graphs (labels, accuracy)** | 10 |  |
| **Answers to Questions** | 10 |  |
| **Organization (format of results and style)** | 10 |  |
| **Total Points** | 40 |  |
|  |
| Comments: |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_