

ENE310: Practical 3 submission - Minimum requirements

Take note of the following minimum requirements that must be included in the report. Meeting these minimum requirements ensure that you achieve 50%. They are by no means the only requirements, and as such a higher mark is not awarded for them. You need to exceed these requirements and provide evidence of additional work, skill mastery and an investigative nature to ensure a higher mark. Use this guide as a checklist to ensure that you include at least the following in your report.

1. Signed declaration stating that the work is your own

- Complete the declaration of originality form provided by the Department of Library Services and upload it along with your submission to the AMS. You can download it from here:
<http://www.library.up.ac.za/plagiarism/docs/declaration.pdf>
- Failing to include the form will result in a zero mark until it is provided.
- A 10% late submission penalty will apply if you forget to upload it to the AMS and request to include it after the submission deadline.

The idea behind the changes to the submission format was to make the minimum requirements much clearer than in previous assignments. This document further extends on what is provided in other documents. Also, consider the following for your XLSX and JPEG submissions specifically related to Questions 4 and 5. The submission requirements for Questions 1 to 3 should be clear enough from the XLSX document description.

4.1 Oscillator performance:

Minimum requirements to include in the discussion to pass:

- The oscillator performance is compared to theory.
- Similarities / differences in performance are discussed.

4.2 Quality factor:

Minimum requirements to include in the discussion to pass:

- Interpretation of Q , i.e. some insight into what Q means (for example is lower/higher Q better?).
- Effect on Q when parasitic effects are introduced.

4.3 Oscillation startup:

Minimum requirements to include in the discussion to pass:

- Start-up strategy presented.
- Differences between simulation and practical circuit discussed.

4.4 THD of oscillators:

Minimum requirements to include in the discussion to pass:

- Provide the THD value.

- Interpretation of THD, i.e. some insight into what THD means (for example, is 1% good or bad for an oscillator?).
- Potential source(s) of THD.

4.5 THD of the extra circuit:

Minimum requirements to include in the discussion to pass:

- Provide the THD value.
- Interpretation of THD, i.e. some insight into what THD means (for example, is 1% good or bad for the extra circuit?)
- A potential source of THD

Rubric for Q4.1 - 4.5 (given out of 10, will be scaled accordingly):

- No submission / invalid or completely incorrect answer. (0)
- Submission severely lacks details. Does not meet the minimum requirements. (2)
- Submission is insufficient and lacks at least some required details to meet the minimum requirements. (4)
- Submission might meet the minimum requirements, but there are mistakes or the presentation is unclear and technical language usage not mastered. (4)
- Submission meets the minimum requirements. No additional aspects discussed. Discussion is sufficient and correct, but not detailed. (5)
- Submission meets the minimum requirements. Discussion of minimum requirements in detail, but with some errors. (6)
- Submission meets the minimum requirements. Discussion of minimum requirements is correct and very thorough. (7)
- Submission exceeds the minimum requirements and shows insight above what was required of the student. Evidence of some extra initiative by the student. (8)
- Submission far exceeds the minimum requirements and shows insight above what was required of the student. Very thorough, accurate discussion presented. Evidence of extra initiative by the student. (10)

5.1 Oscillator start-up:

Minimum requirements to include in the discussion to pass:

- Both oscillators start up.
- Transient analysis (result) of both oscillators showing the start-up in the waveforms with sufficient clarity to read. Axis scales should be correctly set by the student (not too short/long).
- At least one annotation per oscillator showing you can interpret the transient analysis and have determined the start-up time of both oscillators (for example stating "1 ms" that corresponds to your transient result is sufficient).

Additional requirements to exceed minimum requirements:

- Improve the clarity of the presentation of your transient analysis by further annotating the results. This means additional information on the figure showing the reader how to interpret the waveform and obtain the result correctly (for example arrows as in the examples provided).

Rubric (given out of 10, will be scaled accordingly):

- No submission / invalid or completely incorrect answer (0)
- Only one oscillator starts up / transient analysis provided. Does not meet the minimum requirements. (1)
- The transient analysis provided for both oscillators, but they do not meet the specifications. Does not meet the minimum requirements. (3)
- The transient analysis provided for both oscillators, but the start-up time is not provided. No evidence of interpretation of results. Does not meet the minimum requirements. (4)
- Submission meets the minimum requirements only. Specifications met, but with large tolerance. (5)
- Submission meets the minimum requirements only. Specifications met with tight tolerance. (6)
- Submission exceeds the minimum requirements. Specifications met, but with large tolerance. (7)
- Submission exceeds the minimum requirements. Specifications met with tight tolerance. (8)
- Submission far exceeds the minimum requirements. Specifications met, but with large tolerance. Student shows additional initiative that distinguishes the work from others. (9)
- Submission far exceeds the minimum requirements. Specifications met with tight tolerance. Student shows additional initiative that distinguishes the work from others. (10)

5.2 Transient analysis:

Minimum requirements to include in the discussion to pass:

- Transient analysis (result) of both oscillators showing the period in the waveforms with sufficient clarity to read. Axis scales should be correctly set by the student (not too short/long. Show 2-3 periods).
- At least one annotation per oscillator showing you can interpret the transient analysis and have determined the period of both oscillators (for example stating "1 ms" that corresponds to your transient result is sufficient).

Additional requirements to exceed minimum requirements:

- Improve the clarity of the presentation of your transient analysis by further annotating the results. This means additional information on the figure showing the reader how to interpret the waveform and obtain the result correctly (for example arrows as in the examples provided).

Rubric (given out of 10, will be scaled accordingly):

- No submission / invalid or completely incorrect answer (0)
- Only one oscillator's transient analysis is provided. Does not meet the minimum requirements. (1)
- The transient analysis provided for both oscillators, but they do not meet the specifications. Does not meet the minimum requirements. (3)
- The transient analysis provided for both oscillators, but the period is not provided. No evidence of interpretation of results. Does not meet the minimum requirements. (4)
- Submission meets the minimum requirements only. Specifications met, but with large tolerance. (5)
- Submission meets the minimum requirements only. Specifications met with tight tolerance. (6)
- Submission exceeds the minimum requirements. Specifications met, but with large tolerance. (7)

- Submission exceeds the minimum requirements. Specifications met with tight tolerance. (8)
- Submission far exceeds the minimum requirements. Specifications met, but with large tolerance. Student shows additional initiative that distinguishes the work from others. (9)
- Submission far exceeds the minimum requirements. Specifications met with tight tolerance. Student shows additional initiative that distinguishes the work from others. (10)

5.3 Spectral analysis (oscillators):

Minimum requirements to include in the discussion to pass:

- FFT (result) of both oscillators showing the oscillation frequency and harmonics with sufficient clarity to read. Axis scales should be correctly set by the student (not too short/long. Show at least the main frequency and 4-5 harmonics).
- At least one annotation per oscillator showing you can interpret the FFT and have determined the oscillation frequency of both oscillators (for example stating “40 kHz” that corresponds to your simulation result is sufficient).
- At least one annotation per oscillator showing you can interpret the FFT and have determined the THD of both oscillators (for example stating “1%” that corresponds to your simulation result is sufficient).

Additional requirements to exceed minimum requirements:

- Improve the clarity of the presentation of your transient analysis by further annotating the results. This means additional information on the figure showing the reader how to interpret the FFT and obtain the results correctly (for example arrows, details on harmonics, THD calculation, etc. as in the examples provided).

Rubric (given out of 10, will be scaled accordingly):

- No submission / invalid or completely incorrect answer (0)
- Only one oscillator's FFT is provided. Does not meet the minimum requirements. (1)
- FFT analysis provided for both oscillators, but they do not meet the specifications. Does not meet the minimum requirements. (3)
- FFT analysis provided for both oscillators, but the frequencies are not provided. Insufficient evidence of interpretation of results. Does not meet the minimum requirements. (4)
- FFT analysis provided for both oscillators, but the THDs are not provided. Insufficient evidence of interpretation of results. Does not meet the minimum requirements. (4)
- Submission meets the minimum requirements only. Specifications met, but with large tolerance. (5)
- Submission meets the minimum requirements only. Specifications met with tight tolerance. (6)
- Submission exceeds the minimum requirements. Specifications met, but with large tolerance. (7)
- Submission exceeds the minimum requirements. Specifications met with tight tolerance. (8)
- Submission far exceeds the minimum requirements. Specifications met, but with large tolerance. Student shows additional initiative that distinguishes the work from others. (9)
- Submission far exceeds the minimum requirements. Specifications met with tight tolerance. Student shows additional initiative that distinguishes the work from others. (10)

5.4 Schematic of the additional circuit:

Minimum requirements to include in the discussion to pass:

- Provide a circuit schematic of the circuit you selected.

Additional requirements to exceed minimum requirements:

- Complexity is considered. Refer to rubric

Rubric (given out of 10, will be scaled accordingly):

- No submission / invalid or completely incorrect answer (0)
- Circuit from the textbook (lower complexity) (5)
- Circuit from the textbook (higher complexity) (6)
- Circuit from the textbook with additional support circuitry (7)
- Circuit not in the textbook (lower complexity) (8)
- Circuit not in the textbook (higher complexity) (10)

5.5 Spectral analysis (extra circuit):

Minimum requirements to include in the discussion to pass:

- FFT (result) of the extra circuit showing the oscillation frequency and harmonics with sufficient clarity to read. Axis scales should be correctly set by the student (not too short/long. Show at least the main frequency and 4-5 harmonics).
- At least one annotation showing you can interpret the FFT and have determined the oscillation frequency of the extra circuit (for example stating “40 kHz” that corresponds to your simulation result is sufficient).
- At least one annotation showing you can interpret the FFT and have determined the THD of the extra circuit (for example stating “1%” that corresponds to your simulation result is sufficient).

Additional requirements to exceed minimum requirements:

- Improve the clarity of the presentation of your transient analysis by further annotating the results. This means additional information on the figure showing the reader how to interpret the FFT and obtain the results correctly (for example arrows, details on harmonics, THD calculation, etc. as in the examples provided).

Rubric (given out of 10, will be scaled accordingly):

- No submission / invalid or completely incorrect answer (0)
- FFT analysis provided, but the circuit does not meet the specifications. Does not meet the minimum requirements. (3)
- FFT analysis provided, but the frequency is not provided. Insufficient evidence of interpretation of results. Does not meet the minimum requirements. (4)
- FFT analysis provided, but the THD is not provided. Insufficient evidence of interpretation of results. Does not meet the minimum requirements. (4)
- Submission meets the minimum requirements only. Specifications met, but with large tolerance. (5)
- Submission meets the minimum requirements only. Specifications met with tight tolerance. (6)

- Submission exceeds the minimum requirements. Specifications met, but with large tolerance. (7)
- Submission exceeds the minimum requirements. Specifications met with tight tolerance. (8)
- Submission far exceeds the minimum requirements. Specifications met, but with large tolerance. Student shows additional initiative that distinguishes the work from others. (9)
- Submission far exceeds the minimum requirements. Specifications met with tight tolerance. Student shows additional initiative that distinguishes the work from others. (10)