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Analysis of Wesleyan University-Philippines (WU-P) Electronics Engineers Licensure Examinations (2021-2023): Basis for a Proposed Test Bank

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Abstract *— "Analysis of WUP Electronics Engineers Licensure Examinations (2021-2023): Basis for a Proposed Test Bank" is a descriptive study that examines the performance of WUP Electronics Engineering (EE) examinees in four significant subjects, which are Communications Engineering, General Engineering & Applied Sciences, Electronics Engineering, and Engineering Mathematics. With an average mark of 58.8%, well short of the 75% pass requirement, and just 12 out of 80 passing, the figures show that engineering mathematics is the toughest subject. Also, with just 12 passing and an average mark of 63.8%, Electronics Engineering showed a low pass rate. Communications Engineering recorded 21 passes, against 14 pass candidates for General Engineering & Applied Sciences. The overall challenge of the licensing examinations was indicated by the absence of top scores of 95% or higher in any subject among the examinees. The researchers recommend enhancing the curriculum in Electronics Engineering, offering special support for Engineering Mathematics, and implementing practice exams and mock tests to identify areas of weakness and sharpen test-taking skills to enhance student performance. To create a good learning environment, study groups that encourage peer-to-peer collaboration are also recommended. The development of a large test bank that provides personalized practice materials specific to exam structures is at the core of these concepts, with the end goal of improving student preparedness and passing rates.*

Keywords *— **Communications Engineering, Electronics Engineering, General Engineering, Licensure Examination, Mathematics, Wesleyan University-Philippines***

I. INTRODUCTION

The licensure examination is a crucial milestone for engineering students, especially those enrolled in the Electronics Engineering program at Wesleyan University Philippines (WUP). It serves as a formal assessment that certifies whether graduates possess the necessary knowledge, skills, and competencies required to practice professionally. Beyond individual success, passing this test improves the school's standing and guarantees that its graduates fulfill industry requirements, which advances the engineering profession and advances national development (Alam & Forhad, 2022).

For WUP Electronics Engineering students, the licensure exam represents both a challenge and an opportunity. It demands a comprehensive understanding of core engineering principles and the ability to apply theoretical knowledge to practical problems. Successfully navigating this exam opens doors to professional licensure, which is essential for career progression, eligibility for higher positions, and participation in specialized engineering projects. It

also instills confidence and credibility, affirming that the graduate is equipped to uphold safety, innovation, and ethical standards in their work. (Hu, Mao, Fu, Wu, & Zhou, 2023).

Given the significance of the licensure examination, it is imperative for educational institutions like WUP to continuously enhance their academic programs and support systems. This involves embracing novel instructional approaches, revising curricula to meet new industry needs, and equipping students with sufficient resources like review materials, practice examinations, and mentoring. Focusing on critical thinking, problem-solving, and experiential learning can more adequately equip students to contend with the demanding character of the exam and the professional challenges they will encounter in the future (Mangiduyos & Subia, 2021).

In addition, creating an environment of collaboration and inspiration is crucial in assisting students with resilience and confidence development. Providing peer study groups, offering individualized review sessions, and incorporating real-world engineering applications within courses can enhance learning and facilitate exam preparedness (Zhang, Morphew & Stelzer, 2023). With the prioritization of these strategies, Wesleyan University Philippines can equip its Electronics Engineering students to perform well in their licensure examinations and become capable, confident professionals who can contribute valuable services to the field of engineering.

An action that would practically augment the support of WUP Electronics Engineering students on licensure exam preparation is the creation and application of a complete test bank. The test bank will be comprised of a variety of practice questions as well as sample exams on all of the pertinent subjects, formulated to resemble the format and level of difficulty of the real licensure exam. Through consistent interaction with these resources, students can determine their strengths and weaknesses, get accustomed to exam trends, and sharpen their time management and test-taking skills. Moreover, the test bank may also be utilized as an effective tool for educators to customize their teaching strategies and give precise feedback, eventually enhancing the efficacy of exam preparation and passing rates (Harrell, Subramaniam, Long, Thompson, & Pope, 2023).

II. METHODOLOGY

This research study utilized documentary analysis. According to Grant (2022), "documentary analysis is research which involves documents as the data". Licensure examination results from 2021-2023 of the Bachelor of Electronics Engineering of Wesleyan University Philippines were analyzed and explored in this study. A total of 80 examination takers were included in this study. Their examination results were analyzed and discussed in this study. This research was conducted during the second semester of school year 2024-2025.

III. RESULTS AND DISCUSSION

Electronics Engineers Licensure Examination-October 2021, April 2022, October 2022, & April 2023

Table 1. Overall Performance in Engineering Mathematics of 80 Examinees from October 2021 to April 2023

Percentage Scores	Engineering Mathematics
25 to 34	7
35 to 44	4
45 to 54	17
55 to 64	25
65 to 74	15
75 to 84	12
85 to 94	0
95 and above	0
Total Examinees (N)	80
Mean Percentage Score	58.8
Mean Passing Percentage	75
Lowest Score	27
Highest Score	84

Table 1 shows the overall results in Engineering Mathematics of 80 Electronics Engineering takers from the examination in October 2021 to April 2023.

The table shows the scores of 80 students on an Engineering Mathematics test. The majority of students had a score of between 55% and 64%, and fewer students scored very high or very low. The

mean score was 58.8%, which is lower than the pass mark of 75%. The lowest score was 27%, and the highest score was 84%. This indicates a large number of students failed the test, and no one scored in the upper ranges. It indicates that the students felt that the test was difficult and might need extra attention in order to develop their math skills (Kukreti & Broering, 2019). The findings indicate that a considerable number of students are struggling with attaining the required competency in engineering mathematics, which could negatively affect their general academic growth and confidence in the subject. There is a requirement for increased instructional assistance, i.e., increased tutoring, revised pedagogical approaches, or further material to be studied, since the average mark is far from the passing mark, and no student achieved high scores. In an effort to assist students in developing their mathematics base, improving performance, and increasing their chances of success in their engineering degrees, these deficiencies need to be addressed.

Table 2. Overall Performance in Electronics Engineering of 80 Examinees from October 2021 to April 2023

Percentage Scores	Electronics Engineering
25 to 34	0
35 to 44	4
45 to 54	13
55 to 64	20
65 to 74	31
75 to 84	12
85 to 94	0
95 and above	0
Total Examinees (N)	80
Mean Percentage Score	63.8
Mean Passing Percentage	75
Lowest Score	38
Highest Score	82

Table 2 exhibits the overall results in Electronics Engineering of 80 Electronics Engineering takers from the examination in October 2021 to April 2023.

Most Electronics Engineering examinees scored between 55 and 74 percent, with 31 out of 80 getting 65–74 percent and 20 getting 55–64 percent. Very few scored above 75 percent (only 12 people), and nobody scored higher than 84 percent. At the lower end, only 4 people scored between 35–44 percent, and nobody scored below 35 percent.

The average score was 63.8 percent, which is below the passing mark of 75 percent. The lowest score was 38, and the highest was 82. This means most students did not pass, and only a small number came close to or above the passing score. The results suggest that many students need more support or preparation to meet the passing standard.

These findings imply that the majority of Electronics Engineering examinees are struggling to meet the required passing standard, as most scored below 75 percent. This highlights a need for improved teaching strategies or additional support to help more students achieve passing scores (Nurdianingsih, 2021).

Table 3. Overall Performance in General Engineering & Applied Sciences of 80 Examinees from October 2021 to April 2023

Percentage Scores	General Engineering & Applied Sciences
25 to 34	0
35 to 44	10
45 to 54	15
55 to 64	18
65 to 74	22
75 to 84	14
85 to 94	1
95 and above	0
Total Examinees (N)	80
Mean Percentage Score	61
Mean Passing Percentage	75
Lowest Score	35
Highest Score	87

Table 3 presents the overall results in General Engineering and Applied Sciences of 80 Electronics Engineering takers from the examination in October 2021 to April 2023.

Fewer students in General Engineering & Applied Sciences scored higher than 75 percent, while the majority of the 80 students in the course received scores between 55 and 74 percent. Only one student received extremely high scores (between 85 and 94 percent), while other students received lower scores (between 35 and 54 percent).

The minimum passing mark was 75 percent, and the mean score was 61 percent. This means that most of the students failed and need special help to improve their understanding and performance in this area. These findings suggest that most students are struggling to achieve the passing mark in General Engineering & Applied Sciences. It lays emphasis on the need for enhanced teaching approaches and additional support in order for students to move forward with their knowledge and pass the course (Arashpour et al.,2023).

Table 4. Overall Performance in Communications Engineering & Applied Sciences of 80 Examinees from October 2021 to April 2023

Percentage Scores	Communications Engineering & Applied Sciences
25 to 34	2
35 to 44	9
45 to 54	11
55 to 64	16
65 to 74	19
75 to 84	21
85 to 94	2
95 and above	0
Total Examinees (N)	80
Mean Percentage Score	63.4
Mean Passing Percentage	75
Lowest Score	31
Highest Score	87

Table 4 displays the overall results in Communications Engineering and Applied Sciences of 80 Electronics Engineering takers from the examination in October 2021 to April 2023.

Most of the 80 students in Communications Engineering & Applied Sciences did pretty well, with scores between 55 and 84 percent. A smaller number scored below 55, and only a few scored very high over 85 percent. The average score was 63.4%, which is lower than the 75% needed to pass. This means that a lot of students didn't pass and needed extra help to understand the material better and do better in this class.

These results show that a lot of students know the basics of Communications Engineering, but a lot of them are not meeting the passing standard. This shows that more help and specific teaching methods are needed to help more students do well in this subject (Thompson & Copeland, 2020).

Table 5. Summary Table of Electronics Engineers Licensure Examination- October 2021, April 2022, October 2022 & April 2023

Percentage Scores	Engineering Mathematics	Electronics Engineering	General Engineering & Applied Sciences	Communications Engineering
25 to 34	7	0	0	2
35 to 44	4	4	10	9
45 to 54	17	13	15	11
55 to 64	25	20	18	16
65 to 74	15	31	22	19

75 to 84	12	12	14	21
85 to 94	0	0	1	2
95 and above	0	0	0	0
Total Examinees (N)	80	80	80	80
Mean Percentage Score	58.8	63.8	61.0	63.4
Mean Passing Percentage	75	75	75	75
Lowest Score	27	38	35	31
Highest Score	84	82	87	87

The table illustrates that the engineering mathematics subject is the most difficult among the four subjects taken by EE examiners, indicating that just 12 out of 80 candidates achieved a passing grade, with scores varying from 27 to 84. This particular subject is very difficult for WUP EE takers, as indicated by a mean passing rate of 58.8%, which is much lower than the 75% passing threshold. Likewise, Electronics Engineering has also 12 passers like the Engineering Mathematics area, although it is considered easier, with passing score rates of 63.8%; however, it is still below the required 75%.

Only 14 candidates were successful in the field of General Engineering & Applied Sciences, but Communications Engineering had a considerably higher number of successful candidates, with 21 individuals passing. Nevertheless, the lack of any students who achieved the highest grades of 95 and above highlights the overall difficulty of the examination across disciplines for WUP EE students.

Based on these findings, WUP must provide additional support and resources to students struggling with engineering mathematics, such as intensive and targeted study sessions, particularly allocating more time and resources to mastering difficult subjects, aiming to improve their success rate in this challenging subject. Furthermore, there should be a concerted effort to enhance the curriculum and teaching methods in Electronics engineering to bridge the gap between the current passing rate and the required threshold of 75%. Additionally, utilizing practice exams and mock tests can help simulate the exam environment, identify areas of weakness, and refine test-taking strategies. Lastly, collaborating with peers in study groups can foster a supportive learning environment (Vauras et al, 2003).

IV. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are derived from the findings of the study:

1. With a mean score of 58.8%, well below the 75% passing threshold, and only 12 out of 80 candidates passing, engineering mathematics is the most difficult subject for WUP EE examinees.
2. With only 12 passing candidates and an average score of 63.8%, Electronics Engineering is still below the required passing rate even though it is thought to be easier than Engineering Mathematics.
3. Although there were 14 successful applicants in General Engineering & Applied Sciences and 21 in Communications Engineering, no student received a top score of 95 or higher in any subject, underscoring the exams' general difficulty.
4. In order to overcome these obstacles, WUP should give students who are having trouble with Engineering Mathematics extra help through focused, intense study sessions and devote more funds to challenging courses in order to increase success rates.
5. To help students reach the 75% passing requirement, the Electronics Engineering

curriculum and teaching strategies need to be improved.

6. Students can discover their areas of weakness and enhance their test-taking abilities by using practice exams and mock tests.
7. Study groups that promote peer collaboration can establish a nurturing learning atmosphere that promotes greater comprehension.
8. Lastly, it is advised that a thorough test bank be created in order to give students a wealth of practice materials that are specific to the exam format, enabling them to better prepare and perform better overall.

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