

RESPONSE SURFACE METHODOLOGY (RSM) APPROACH FOR OPTIMIZING WASTE-BASED ACOUSTIC PANELS IN GENERATOR SET NOISE REDUCTION AT PT X

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Abstract

Generator set operation at PT X produced noise levels above the workplace threshold limit, reaching 89.9 dBA in 2025. This study aimed to optimize generator set noise reduction using waste-based acoustic panels made from bamboo, cassava peel, and sawdust through Response Surface Methodology (RSM). The analyzed factors were material type, panel thickness, and testing duration, while the response was noise reduction in decibels. The experimental data were processed using Design Expert software with a D-Optimal design. The results showed that the linear model was the most suitable model, with a significant p-value, non-significant lack of fit, and good predictive ability. ANOVA results indicated that material type was the most dominant factor, followed by panel thickness and testing duration. Among the three waste materials, bamboo composite produced the best damping performance. The optimum condition was achieved using bamboo composite with a thickness of 2 cm, resulting in a predicted noise reduction of approximately 12 dB. The optimized result was then applied to a generator set enclosure design using SketchUp to support practical visualization and technical planning.

Keywords:

Acoustic panel; generator set noise; noise reduction; response surface methodology; waste materials.

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1. Introduction

The use of generator sets as backup power sources has increased in industrial and office areas because companies require stable electricity to support operational activities. However, generator set operation can produce high noise levels that may affect worker comfort, communication, concentration, and occupational health. Kurniati et al. (2024) stated that noise from power generation machinery can cause discomfort and serious health effects for workers. In Indonesia, the Minister of Manpower Regulation Number 5 of 2018 sets the threshold limit value for workplace noise exposure at 85 dBA for an 8-hour working period [1].

PT X is a company engaged in the distribution and remanufacturing of heavy equipment components. Field noise measurement in the generator set area of PT X showed a noise level of 89.9 dBA in 2025, which exceeded the permitted threshold limit. This condition indicates the need for noise control to reduce occupational health risks. Continuous exposure to noise at or above 85 dBA can increase the risk of Noise-Induced Hearing Loss (NIHL) [2].

Noise reduction using acoustic panels is affected by several factors, including material type, panel thickness, and testing duration. In this study, bamboo, cassava peel, and sawdust were selected as waste-based acoustic panel materials because these materials have fibrous and porous structures that may support sound damping performance. These three waste materials also represent a practical alternative for developing low-cost and sustainable acoustic panels. However, their damping performance may differ depending on material characteristics, thickness, and testing duration. These factors may interact with each other and influence the final noise reduction value. Therefore, determining the best combination of factors cannot rely only on trial-and-error testing. A structured optimization method is needed to analyze factor effects, interaction effects, and optimum conditions more efficiently [2].

Response Surface Methodology (RSM) is a statistical and mathematical method used to model and optimize a response that is influenced by several input variables. RSM can identify the relationship between factors and responses, evaluate interaction effects, and determine optimum process conditions with fewer experimental runs. Widarsaputra et al. (2022) explained that RSM is useful for optimizing processes because it can generate predictive models and determine the most effective combination of parameters [3].

Design Expert software is commonly used to support RSM analysis because it provides experimental design, model evaluation, analysis of variance, response surface plots, and optimization features. Hidayat et al. (2020) stated that Design Expert can be used to determine optimum formulations through screening, characterization, and optimization stages. This makes the software relevant for studies that involve several experimental factors and require an optimum response [4].

Several studies have applied RSM to optimize composite materials and waste-based formulations. Mbozo'o et al. (2024) showed that RSM can be used to optimize cassava peel and sawdust composite formulations to obtain better material performance. However, the application of RSM for optimizing generator set noise reduction using waste-based acoustic panels remains limited, especially in industrial work areas in Indonesia [5].

This study applies Response Surface Methodology using Design Expert software to optimize generator set noise reduction at PT X. The factors analyzed in this study include material type, namely bamboo, cassava peel, and sawdust, panel thickness, and testing duration, while the response variable is noise reduction in decibels. This study aims to develop an RSM-based predictive model and determine the optimum parameter combination that produces the highest noise reduction. The results are expected to support more efficient industrial noise control and provide a practical reference for acoustic panel optimization using waste-based materials.

2. Method

A. Research Design

This study used a quantitative experimental approach with Response Surface Methodology (RSM) using Design Expert software. RSM was applied to analyze the relationship between experimental factors and the noise reduction response. The method was also used to determine the optimum combination of factors that produced the highest noise reduction in the generator set area of PT X.

B. Experimental Factors and Response

The factors used in this study were material type, panel thickness, and testing duration. The material types consisted of bamboo, sawdust, and cassava peel. The panel thickness levels were 1 cm, 1.5 cm, and 2 cm. The testing durations were 10 seconds, 30 seconds, and 60 seconds. The response variable was noise reduction, measured in decibels (dB), based on the difference between the noise level before and after the acoustic panel was applied.

C. RSM Design

The experimental design was generated using Design Expert software with the D-Optimal design. This design was selected because it can arrange experimental runs efficiently based on the selected factors and levels. The input factors and response data were entered into the software to develop a predictive model for noise reduction.

D. Data Analysis

The experimental data were analyzed using analysis of variance (ANOVA) in Design Expert. The analysis included model significance, F-value, p-value, lack of fit, and R-squared value. These parameters were used to evaluate the suitability and accuracy of the model. A response surface plot and contour plot were also generated to observe the interaction between factors and their effect on noise reduction.

E. Optimization Process

The optimization process was conducted to determine the best combination of material type, panel thickness, and testing duration. The main optimization goal was to maximize noise reduction. The optimum solution generated by Design Expert was then compared with the experimental results to evaluate the reliability of the model.

3. Result and Discussion

Optimal Response Surface Methodology (RSM) Test

A. Fit Summary Results

The fit summary analysis was used to determine the best model for representing the relationship between the research variables and the response. According to Septiani et al. (2023), the fit summary helps identify the most appropriate model based on statistical indicators generated from the RSM analysis [6]. The fit summary results are presented as follows:

Table 1. Optimal Model Fit Summary Results

<i>Fit Summary</i>				
<i>Source</i>	<i>Sequential p-value</i>	<i>Lack of Fit p-value</i>	<i>Adjusted R²</i>	<i>Predicted R²</i>
<i>Linear</i>	< 0,0001	0,4236	0,8027	0,7497
<i>2FI</i>	0,4635	0,3921	0,8012	0,5256
<i>Quadratic</i>	0,0969	0,5772	0,8281	0,5427
<i>Cubic</i>	0,4483	0,7974	0,8312	

Based on Table 1, the linear model was selected as the most suitable model because it had a significant sequential p-value of <0.0001 and a non-significant lack of fit p-value of 0.4236 (>0.05). This indicates that the model was significant and showed no meaningful deviation from the experimental data. This finding is in line with Adisalamun et al. (2019), who stated that an RSM model is considered adequate when the model p-value is significant and the lack of fit is not significant [7].

The linear model also had the highest predicted R² value of 0.7497, showing better predictive ability than the 2FI and quadratic models. The difference between adjusted R² and predicted R² was also less than 0.2, indicating stable model prediction, as supported by Khan et al. (2019). Therefore, the linear model was considered sufficient to describe the effects of thickness, testing duration, and material type on sound damping performance. A confirmation test was then conducted to validate the RSM optimization results [8].

B. Confirmation Test Results

The confirmation results represent the validation stage used to compare the predicted values with the actual experimental values [9].

Table 2. Confirmation Test Results

<i>Confirmation</i>							
<i>Analysis</i>	<i>Predicted Mean</i>	<i>Predicted Median</i>	<i>Std Dev</i>	<i>n</i>	<i>Se Pred</i>	<i>95% PI Low</i>	<i>95% PI high</i>
<i>Sound_Absorption</i>	9,32	9,32	1,49	1	1,57	6,11	12,54

Based on the confirmation test in Table 2, the RSM model predicted a sound damping effectiveness of 9.312 dB, or approximately 9.32 dB. This value represents the estimated response generated by the model. The standard deviation of 1.49 indicates relatively low prediction variation, meaning that the model has good consistency [9]. The standard error of prediction of 1.57 also shows an acceptable level of prediction uncertainty [10].

The 95% prediction interval ranged from 6.11 dB to 12.54 dB, indicating that the actual experimental value is expected to fall within the model prediction range, as explained by Kunarto et al. (2019). Therefore, the confirmation results show that the RSM model is representative enough to predict sound damping effectiveness [11].

C. ANOVA Test Results

ANOVA results were used to identify the effect of each research variable and determine the most dominant variable influencing the response. This analysis also evaluates the interaction between variables in affecting the response [12]. The ANOVA results obtained from the RSM analysis are presented as follows:

Table 3. ANOVA Test Results

Annova For Linier Model					
Source	Sum of Squares	df	Mean Squares	F-value	p-value
Model	279,86	4	69,97	31,51	<0,0001
A-Ketebalan	31,28	1	31,28	14,08	0,0009
B-Durasi	16,04	1	16,04	7,22	0,0124
C-Bahan	212,75	2	106,38	47,90	<0,0001
Residual	57,74	26	2,22		
Lack of fit	35,09	15	2,34	1,14	0,4236
Pure Error	22,65	11	2,06		
Car Total	337,60	30			

Based on the ANOVA results in Table 3, the RSM model showed a very high level of significance, with a p-value of <0.0001. This indicates that thickness, duration, and material type affected sound damping effectiveness. Material type was the most dominant factor (p-value <0.0001), followed by thickness (p-value = 0.0009) and duration (p-value = 0.0124). The relatively small residual value indicates a low model error, so the model can explain the experimental data accurately. This is in line with Hapsari et al. (2021), who stated that a p-value below 0.05 indicates a significant effect [13]. In addition, the lack of fit p-value of 0.4236 (>0.05) shows no significant difference between the model and the actual data, meaning that the model is fit and suitable for use [9].

D. Graphical Results of the Optimization Test

The contour plot in the RSM method is a two-dimensional visualization used to show the relationship between two variables and the resulting response. In this study, the contour plot was used to observe the effect of experimental factors on sound damping effectiveness.

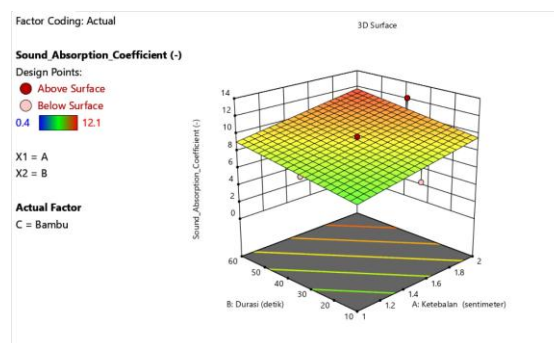


Figure 1. RSM Optimization Graph for Bamboo

Figure 1 shows that increasing the bamboo composite thickness to 2 cm resulted in higher sound absorption values. The contour plot indicates a response range from 0.4 dB to 12.1 dB, with the optimum condition achieved at a thickness of 2 cm and a duration of 38 seconds, as shown in Appendix 9. The color transition from green to orange indicates increased damping effectiveness, while the midpoint at 1.5 cm thickness represents moderate sound absorption. These results indicate that the bamboo

composite performed most efficiently at a thickness of 2 cm, which is consistent with Azharini et al. (2021), who stated that color gradients toward orange represent maximum absorption response [12].

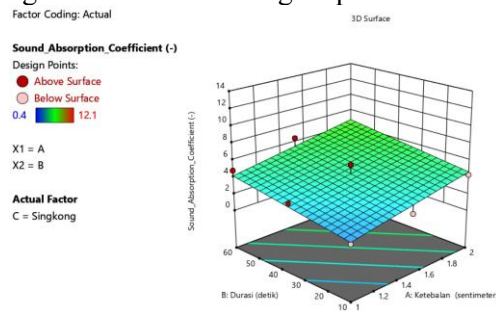


Figure 2. RSM Optimization Graph for Cassava Peel

Figure 2 shows that the cassava peel composite had a contour pattern ranging from blue to green, indicating an increase in sound damping performance from low to moderate levels. The optimum condition was achieved at a thickness of 1.5 cm and a duration of 60 seconds, producing a noise reduction value of 6.5 dB, as shown in Appendix 9. This result is consistent with Kunarto et al. (2019), who stated that contour patterns reflect the relationship between variables and the model response [11].

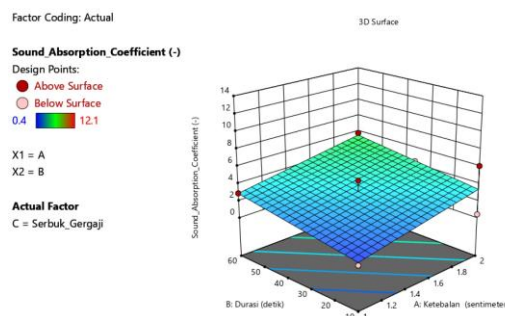


Figure 3. RSM Optimization Graph for Sawdust

Figure 3 shows the RSM contour graph for sawdust. The contour pattern indicates that increasing thickness and testing duration improved the sound absorption response. The relatively parallel contour lines show a linear relationship, with thickness having a more dominant effect than duration. The optimum response was obtained at a thickness of 2 cm and a duration of 60 seconds, as shown in Appendix 9. Under this condition, the sawdust composite reduced sound absorption by 6.1 dB. The contour result is in line with Anwar et al. (2021), who stated that a higher response tends to occur at the maximum thickness level. After the RSM analysis was completed, bamboo with a thickness of 2 cm was identified as the most optimal material for noise reduction [9].

Panel Design Planning

Panel design was developed as a sound damping solution for the generator set area. The design was adjusted based on Occupational Safety and Health principles and supporting literature related to noise enclosure systems. The design results are presented as follows:



Figure 4. Noise Damping Panel Design Based on PT X Area Dimensions

Figure 4 shows the front-view design of the generator set enclosure created using SketchUp. SketchUp was used to produce a three-dimensional design visualization, making the design process easier, faster, and less prone to errors. This is in line with Satria et al. (2024), who stated that SketchUp supports more efficient 3D design processes [14]. The generator set enclosure was designed based on field observations at PT X, with dimensions of 9 m in length, 9 m in width, and 4 m in height. This room size is considered adequate to support operator activities, including inspection, operation, and maintenance of the generator set safely. This finding is consistent with Anggrila (2023), who stated that workspace area affects the smoothness and safety of work processes [15].

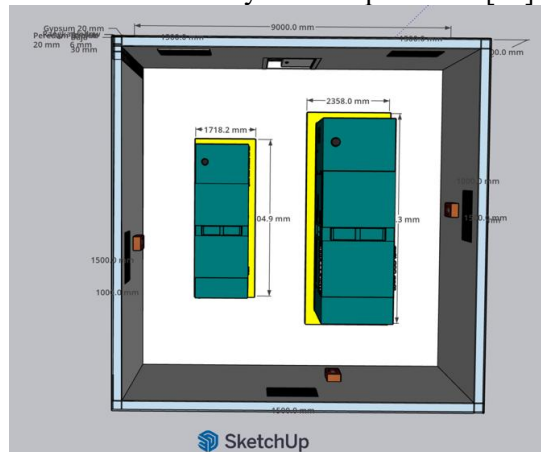


Figure 5. Top View of the Noise Damping Panel Design

Figure 5 shows the top-view design of the generator set enclosure. The generator set was placed 1.5 m from the front, side, and rear areas, with a 1.94 m distance between units to support operator movement during operation, inspection, and maintenance. Each corner of the enclosure was equipped with $1.5 \text{ m} \times 1 \text{ m}$ ventilation to support air circulation.

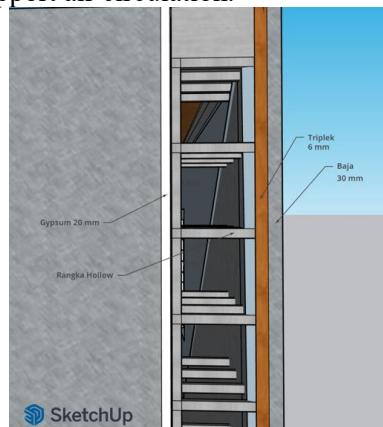


Figure 6. Structure of the Acoustic Layer Without Damping Material

Figure 6 shows the enclosure material structure before the composite layer was added. The innermost layer used 2 cm gypsum as an initial protective layer because it has fire-resistant properties and supports passive fire protection. This material selection also considered Occupational Safety and Health aspects, in line with Gogendra et al. (2020) and Law No. 1 of 1970 [17]. The next layer used 2 cm hollow steel as the frame to strengthen the structure, maintain bamboo composite stability, and improve construction safety [18].

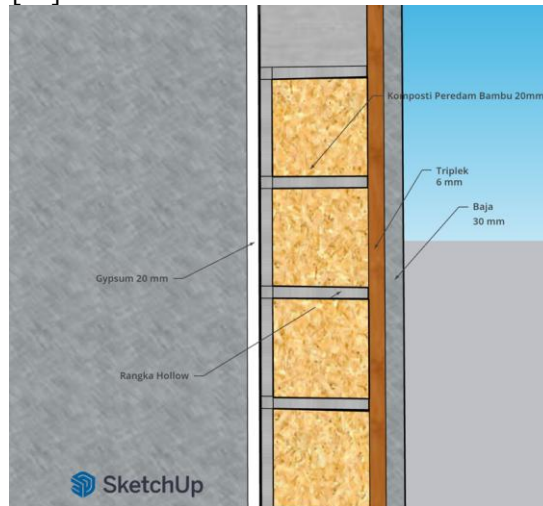


Figure 7. Structure of the Hollow Steel Layer and Composite Assembly

Figure 7 shows that the third layer used a 2 cm bamboo composite, based on the RSM optimization results, which reduced noise by up to 12 dB. Bamboo was selected because its natural porous structure can absorb sound waves [19]. The next layer used 6 mm plywood as a cover, which also supports noise damping [20]. The outermost layer used 3 cm steel as protection against weather, external loads, and additional generator set noise barriers [21].

4. Conclusion

This study shows that Response Surface Methodology (RSM) can effectively model and optimize generator set noise reduction at PT X. The linear model was selected as the most suitable model because it had a significant p-value, non-significant lack of fit, and good predictive ability. The ANOVA results showed that material type was the most dominant factor, followed by panel thickness and testing duration. The optimization results indicated that bamboo composite with a thickness of 2 cm produced the highest noise reduction, with a predicted optimum value of approximately 12 dB. Therefore, RSM can be used as an efficient method to determine the optimum acoustic panel parameters for industrial noise control.

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Lulusan Baru (Fresh Graduate) Rekayasa Keselamatan dari Institut Teknologi Kalimantan dengan pemahaman mendasar yang kuat tentang manajemen risiko, K3, dan kepatuhan regulasi industri. Memiliki rekam jejak pengalaman kerja, magang, dan organisasi yang mengasah kemampuan analisis data keselamatan serta manajemen proyek. Dikenal sebagai pribadi dengan loyalitas tinggi, berintegritas, dan memiliki kesadaran diri (self-awareness) yang baik untuk terus berkembang. Mampu berkomunikasi dan berkolaborasi secara efektif, baik dalam kerja sama tim multidisiplin maupun saat mengemban tanggung jawab secara mandiri secara individu.

Pengalaman Magang

1. PT Hexindo Adiperkasa Tbk.- Kalimantan Timur Tim Quality, Health, Safety, and Environment (QHSE) (Juli 2025 – Agustus 2025)
 - Melakukan inspeksi berkala dan pemeliharaan pada sistem Alat Pemadam Api Ringan (APAR) di seluruh area kerja untuk memastikan kesiapan tanggap darurat sesuai standar keselamatan.
 - Melakukan pengecekan rutin dan pengujian fungsionalitas sistem proteksi kebakaran aktif pada setiap pos hidran di lingkungan perusahaan.
 - Merancang denah sampling pengujian lingkungan kerja khusus untuk pengukuran intensitas pencahayaan guna memastikan kenyamanan dan kepatuhan terhadap regulasi K3.
 - Membuat dan memperbarui sketsa peta jalur evakuasi di setiap titik lokasi kerja menggunakan perangkat lunak AutoCAD untuk mengoptimalkan rencana tanggap darurat bencana.
 - Menyusun materi, modul, dan topik Safety Talk harian yang edukatif untuk diberikan kepada pekerja sebelum operasional dimulai guna meningkatkan kesadaran keselamatan.
 - Mengembangkan materi edukasi dan media informasi visual mengenai hari peringatan K3 serta pentingnya budaya keselamatan kerja untuk meminimalisir risiko insiden di tempat kerja.
2. PT Pertamina Regional 6 Balikpapan - Kalimantan Timur Tim IT Support (Oktober 2019 - Desember 2019)
 - Menyediakan layanan IT Support responsif bagi seluruh pekerja di area Regional 6 (MOR VI), termasuk penanganan masalah (troubleshooting) perangkat keras dan perangkat lunak untuk menjaga kelancaran operasional bisnis.
 - Mengonfigurasi dan mengintegrasikan sistem pencetakan (printer HP) berbasis autentikasi ID Card pekerja guna meningkatkan keamanan dokumen perusahaan.
 - Melakukan pemeliharaan dan perbaikan infrastruktur jaringan lokal (LAN), termasuk proses crimping kabel dan optimalisasi konektivitas fisik di area kerja perusahaan.
 - Melakukan instalasi Sistem Operasi (Operating System), pembaruan perangkat lunak (software update), serta konfigurasi sistem perangkat komunikasi HT (Handie Talkie) sesuai standar TI perusahaan.
 - Mengelola administrasi gudang IT dengan melakukan pencatatan logistik keluar-masuk barang serta mengelola pencadangan data (data backup) inventaris aset TI secara berkala.

Pengalaman Pekerjaan

1. PT Hydro Jotalindo Perkasa - Kalimantan Timur Admin Project Control (November 2021 - Juli 2022)
 - Bertindak sebagai Permit Holder resmi yang bertanggung jawab penuh dalam penyusunan, pengajuan, dan pengelolaan Izin Kerja Aman (Permit to Work) untuk seluruh aktivitas operasional di area fabrikasi
 - Mengelola sistem input-output data progres fabrikasi pipa proyek Pertamina secara akurat guna memastikan seluruh tahapan produksi berjalan sesuai dengan lini masa proyek.

	<ul style="list-style-type: none"> Menyusun laporan inspeksi pipa finishing untuk pengajuan verifikasi kualitas kepada tim Quality Control (QC) sebelum material diizinkan keluar dari area fabrikasi. Membuat laporan logistik dan dokumen pengajuan mobilisasi pipa yang telah lulus uji dari area fabrikasi menuju area pemasangan di Kilang Pertamina. Melakukan verifikasi dan rekonsiliasi data komposisi material pipa antara gambar teknik AutoCAD dengan kondisi aktual di lapangan sesuai dengan spesifikasi yang diminta oleh Pertamina. Menyiapkan dan mengorganisir dokumen teknis serta berkas manifes pipa untuk kebutuhan analisis engineer dalam melakukan pengecekan komposisi material. <p>2. PT Quick Test Indonesia - Kalimantan Timur Admin Data Entry (Juli 2021 - Oktober 2022)</p> <ul style="list-style-type: none"> Mengelola proses input data medis, profil, serta riwayat kesehatan pasien secara akurat ke dalam sistem basis data layanan kesehatan perusahaan dengan menjaga kerahasiaan informasi medis. Mengorganisir dan mengelola sistem pengarsipan dokumen rekam medis pasien sesuai dengan prosedur administrasi perusahaan guna memastikan kemudahan aksesibilitas dan keamanan data. Bertanggung jawab dalam memproses dan menerbitkan dokumen hasil pemeriksaan laboratorium/medis pasien secara tepat waktu untuk diserahkan kepada pihak terkait secara valid. <p>Pendidikan</p> <ol style="list-style-type: none"> Sarjana Teknik Rekayasa Keselamatan Insitut Teknologi Kalimantan (Agustus 2022 - Juli 2026) <ul style="list-style-type: none"> Aktif dalam riset internal bidang Keselamatan dan Kesehatan Kerja (K3), dipercaya sebagai Asisten Mata Kuliah Konsep Kecelakaan dan Investigasi, Rekayasa Keselamatan Bahan Kimia, serta berkontribusi dalam penulisan dan publikasi artikel ilmiah nasional/internasional. Skripsi: “Analisis Peredam Kebisingan di Area PT Genset pada PT X dengan Bahan Limbah Kulit Singkong, Serbuk Gergaji, dan Bambu Menggunakan Response Surface Methodology (RSM)” Sekolah Menengah Kejuruan Jurusan Teknik Komputer & Jaringan SMKN 6 Balikpapan (Juli 2018 - April 2021) <ul style="list-style-type: none"> Aktif dalam pendalaman instalasi infrastruktur jaringan konfigurasi perangkat keras dan lunak, dasar dasar troubleshooting perangkat TI, manajemen kabel (crimping), sistem operasi, serta penerapan prosedur Keselamatan dan Kesehatan Kerja (K3) di lingkungan proses kerja komputer. <p>Organisasi & Volunteer</p> <p>Green Generation (Anggota) - SMKN 6 Balikpapan Januari - September 2019 PMR (Anggota) - SMKN 6 Balikpapan Januari - Desember 2019 Staff Magang Hubungan Luar - ITK. Maret - April 2023 Staff KM ITK BEM (Kesma) - ITK. September 2023 - Desmber 2024 Steering Committe (SC) Dream Sponsor - ITK Januari - Mei 2025 Volunteer Peduli Anak Jalanan September 2023 - Sekarang</p> <p>Kemampuan & Keahlian</p> <ol style="list-style-type: none"> Microsoft Office Atucoat (Pemula) Sketchup (Pemula) Canva Design expert Permit Holder Pengelolaan Dokumen & Data entry Memiliki Komunikasi yang baik Bekerja sama dengan tim <p>Manajamen waktu yang baik</p>
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	<p>Arlita Dwi Agustine</p> <p>Profil Saat ini bekerja sebagai dosen di perguruan tinggi negeri dengan keahlian dalam pengajaran, penelitian, dan pembimbingan akademik di bidang Rekayasa Keselamatan dan rumpunnya. Berpengalaman pula sebagai Environment Officer di bidang Keselamatan dan Kesehatan Kerja selama lebih dari 1 tahun. Memiliki sertifikasi Ahli K3 Umum Kemenaker dan Auditor SMK3 BNSP. Siap berkolaborasi dengan Industri.</p> <p>Work Experience</p> <ol style="list-style-type: none"> Dosen Prodi Rekayasa Keselamatan (Juli 2025-sekarang) Institut Teknologi Kalimantan - Balikpapan, Kalimantan Timur <ul style="list-style-type: none"> Mengajar dan membimbing mahasiswa pada tingkat perguruan tinggi. Menyusun materi kuliah dan Rencana Pembelajaran Semester (RPS). Melakukan penelitian dan publikasi ilmiah. Melaksanakan pengabdian kepada masyarakat. Mengelola administrasi akademik dan berpartisipasi dalam kegiatan institusi. Safety Environment Officer (Januari 2023 - Oktober 2024) PT. Wasa Mitra Engineering - Manyar Smelter Project, Gresik. <ul style="list-style-type: none"> Melakukan inspeksi lingkungan kerja dan pengukuran kebisingan/pencahayaannya secara berkala. Mengelola limbah B3 dan bahan berbahaya bersama tim logistik dan PPLI. Menyusun jadwal dan memimpin kegiatan housekeeping harian dengan Tim 5R dan subkontraktor. Memastikan kepatuhan terhadap peraturan lingkungan selama proyek berlangsung. Memantau aktivitas proyek (lifting, hot work, pra-commissioning), memastikan izin kerja dan PTI terpenuhi Admin Finance Staff (Oktober 2022 - Januari 2023) PT. Merak Jaya Beton - Surabaya <ul style="list-style-type: none"> Melakukan input dan rekapitulasi laporan barang masuk (GID) dari seluruh plant menggunakan Oracle. Melakukan rekap dokumen perjalanan dan laporan penerimaan barang antar divisi. Melakukan pemeriksaan silang registrasi pembelian untuk unit usaha terkait. Berkoordinasi dengan divisi hutang dan invoice dalam proses administrasi keuangan. Admin Freelance (Januari 2020 - Januari 2022) PT. Sinergia Internasional Edutama - Surabaya <ul style="list-style-type: none"> Membantu proses rekrutmen karyawan, mulai dari seleksi awal hingga psikotest dan rekap hasil. Menyusun laporan rekrutmen harian, mingguan, dan bulanan untuk HRD dan Direktur Utama. Mendukung operasional PJJ melalui Zoom dan Google Meet. Membantu tim media sosial dalam pembaruan konten Instagram perusahaan. Koordinator Akademik dan Tutor MIPA (Mei 2018 - September 2022) Klinik Belajar Edu Privat & PT. Kreasi Edulab Indonesia - Surabaya <ul style="list-style-type: none"> Mengatur jadwal pengajaran. Memperbarui kurikulum terbaru dari Kemendikbud untuk persiapan materi pembelajaran. Mengajar Matematika, Kimia, Fisika, dan Biologi untuk tingkat SD-SMA dan persiapan SBMPTN (guru penuh waktu dan lepas). Mendukung tim media sosial dalam pembaruan konten Instagram perusahaan. Berpartisipasi dalam kegiatan pemasaran perusahaan saat roadshow ke sekolah-sekolah. <p>Education</p> <ol style="list-style-type: none"> Institut Teknologi Sepuluh Nopember (September 2020 - September 2022) Surabaya Magister Teknik Departemen Teknik Lingkungan, FTSPK Universitas Brawijaya (September 2013 - Juli 2017) Malang Sarjana Sains Departemen Kimia, FMIPA <p>Skills</p> <ol style="list-style-type: none"> Microsoft Office 365 Administrative Tasks Manajemen Dokumen Environmental Awareness dan Environmental Chemistry
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	5. Chemical Handling 6. Data Entry
	<p>Novita Lizza Anggraini Tempat/Tanggal Lahir: Mulyorejo, 23 November 1994 Jabatan Fungsional: Asisten Ahli No. Telp: 085340855532 Email: novita.anggraini@lecturer.itk.ac.id Alamat: Balikpapan, Kalimantan Timur</p> <p>Mata Kuliah yang Diampu:</p> <ol style="list-style-type: none"> 1. Higiene Industri 2. Risiko Keselamatan Bahan 3. Kimia 4. Standar dan Regulasi K3 5. Fisiologi dan Toksikologi 6. Pengendalian Ledakan dan 7. Bahaya Ledakan 8. AMDAL dan ADKL <p>Judul Buku</p> <ol style="list-style-type: none"> 1. Anatomi Fisiologi Tubuh Manusia <p>HKI</p> <ol style="list-style-type: none"> 1. Anatomi Fisiologi Tubuh Manusia 2. Safety Induction 3. Pengembangan Wisata Berbasis Edukasi di Kampung Wisata Bekantan Balikpapan 4. Video Profil Program Studi Rekayasa Keselamatan <p>Riwayat Pendidikan</p> <ol style="list-style-type: none"> 1. SDN 180 Rawamangun 1 (2001 - 2007) 2. SMPN 1 Sukamaju (2007 - 2010) 3. SMAN 8 Masamba (2010 - 2013) 4. S1 Universitas Muslim Indonesia Program Studi Kesehatan Lingkungan Fakultas Kesehatan Masyarakat (2013 - 2017) 5. S2 Universitas Gadjah Mada Peminatan K3, Program Studi Ilmu Kesehatan Masyarakat Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan (2018 - 2020) <p>Pengalaman Kerja</p> <ol style="list-style-type: none"> 1. BNPB Kota Makassar Tracer Covid 29 (2020 - 2021) 2. Universitas Tadulako, Kota Palu. Dosen Kontrak BLU di Fakultas Kesehatan Masyarakat, Peminatan Keselamatan dan Kesehatan Kerja (K3) (2021 - 2022) 3. Institut Teknologi Kalimantan, Kota Balikpapan. Dosen PNS Fakultas Rekayasa dan Teknologi Industri, Jurusan Rekayasa Industri, Program Studi Rekayasa Keselamatan (2022 - Sekarang) <p>Sertifikasi Kompetensi</p> <ol style="list-style-type: none"> 1. Ahli K3 Umum 2. SCM Produksi 3. Operator K3 Listrik 4. Higiene Industri Muda 5. Auditor Mutu Internal 6. Auditor Manajemen Keselamatan dan Kesehatan Kerja (SMK3) <p>Publikasi</p> <ol style="list-style-type: none"> 1. Penerapan Hazard Analysis Critical Control Points (HACCP) pada Proses Produksi Amplang di Kota Balikpapan 2. Analisis Hubungan antara Dimensi Big Five Personality dengan Riwayat Kecelakaan Truk antar Provinsi 3. Refactoring Microservice Sistem Informasi Penjaminan Mutu Institut Teknologi Kalimantan 4. Analisis faktor risiko ergonomi terhadap keluhan musculoskeletal disorder (MSDS) pekerja kurnia lurik sewon Bantul Daerah Istimewa Yogyakarta (DIY) 5. Rancangan Desain Tampilan Website Dinas Perpustakaan Dan Arsip Kota Balikpapan Menggunakan Kansei Engineering 6. Identifikasi Risiko Bahaya Psikososial pada Pekerja yang Menderita Kanker Payudara

	<p>Muthi'Ah Nur Fadlilah Tempat dan Tgl Lahir: Pasir, 27 Oktober 1995 Alamat E-mail: muthiah.fadlilah@lecturer.itk.ac.id Nomor Telp./HP: 081391101240</p> <p>Mata Kuliah yang Pernah Diampu</p> <ol style="list-style-type: none"> 1. Kimia Dasar (3 sks) 2. Manajemen Keselamatan Pangan (3 sks) 3. Keselamatan Kimia (3 sks) <p>Riwayat Pendidikan</p> <ol style="list-style-type: none"> 1. Universitas Muhammadiyah Surakarta, Teknik Kimia (2013 - 2018) 2. Universitas Diponegoro, Teknik Kimia (2019 - 2023) <p>Penelitian</p> <ol style="list-style-type: none"> 1. Analisis Peredam Kebisingan Di Area Genset Pada Pt. X Dengan Bahan Limbah Kulit Singkong, Serbuk Gergaji, Dan Bambu Menggunakan Response Surface Methodology (2026) 2. Rekayasa Sistem Aerasi Microbubble Filtrasi untuk Degradasi Senyawa Organik pada Air Limbah Landfill sebagai Upaya Mitigasi Risiko Lingkungan (2026) <p>Pengalaman Pengabdian Masyarakat</p> <ol style="list-style-type: none"> 1. Pemberdayaan Masyarakat Berbasis Lingkungan Melalui Program Polikultur Lahan dan Penampungan Plastik Perumahan Atlantic Village (2026) 2. Transformasi Limbah TKKS Menjadi Sumber Ekonomi Baru: Kolaborasi Dengan KWT Wanita Mandiri Dalam Budidaya Jamur Tiram Di Kecamatan Sepaku (2025) 3. Pemberdayaan UMKM Pantai Serumpun Teritip Melalui Produksi Serbuk Rumput Laut Sebagai Produk Inovatif Unggulan Pesisir (2025) <p>Penulisan Artikel</p> <ol style="list-style-type: none"> 1. Potential of biomass waste into briquette products in various types of binders as an alternative to renewable energy: A review (2023) 2. The effect of salinity on the interaction between microplastic polyethylene terephthalate (PET) and microalgae Spirulina sp. (2022) 3. Study on making a prototype dye sensitized solar cell (DSSC) as an alternative electric energy source (2021) 4. Identifikasi HACCP (Hazard Analysis Critical Control Point) pada UKM Amplang Ikan Bandeng di Kalimantan (2021) 5. Bioelectricity production from tofu wastewater using microbial fuel cells with microalgae Spirulina sp as catholyte (2020) 6. Biodiesel Production from Reutealis Trisperma Oil Using KOH Impregnated Eggshell as a Heterogeneous Catalyst (2019) <p>Seminar Ilmiah</p> <ol style="list-style-type: none"> 1. Study on making a prototype dye sensitized solar cell (DSSC) as an alternative electric energy source (2020) <p>Pelatihan</p> <ol style="list-style-type: none"> 1. Safety Inspector (Peserta) (2018) 2. Food Safety Management System (ISO 22000:2018) (Peserta) (2024) 3. Hazard Analysis and Critical Control Point (HACCP) (Peserta) (2024) 4. Good Manufacturing Practices (Peserta) (2024) 5. Pelatihan Penjamah Makanan (Pembimbing) (2025) <p>HKI</p> <ol style="list-style-type: none"> 1. Gambar Desain Lahan Polikultur : Peningkatan dan Pengelolaan Lahan Berkelanjutan Berbasis Integrasi Polikultur, Biopori dan Sistem Irigasi Sederhana pada Kawasan Perumahan Atlantic Village (2026) 2. Skematik Desain Rancangan Aerasi Microbubble Filtrasi (2026) 3. Skematik Tahapan Pembuatan Serbuk Rumput Laut (2025) 4. Skematik Proses Pembuatan Baglog Jamur dari Limbah TKKS (2025)
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	<p>Kalimantan (Athaya Nur Khayyirah, Aderyan Feby Haqim, Muhammad Azhar Hafizh Giffari, Emayanti, Hasan Ibrahim, Nur Rahmadania, Anis Rohmana Malik) di Pabrik Harber pada tahun 2025.</p> <p>4. Penerapan Metode HIRADC Untuk Evaluasi Risiko Kecelakaan Kerja: Studi Kasus di Divisi Operasional Sistem PT XYZ yang diterbitkan pada <i>JPK: Jurnal Penelitian Kesehatan</i>, 15(1), 82–91 oleh Program Studi Rekayasa Keselamatan, Institut Teknologi Kalimantan (Athaya Nur Khayyirah, Aderyan Feby Haqim, Andi Nafisha Azzahra, Aziza Putri Habiba, Gizka Rivanty Pangngaroan, Rahmawati Basran, Anis Rohmana Malik) di PT PLN (Persero) UP2B Kaltimra pada tahun 2025.</p> <p>5. Footrest Design in Achieving an Ergonomic Sitting Posture yang diterbitkan pada <i>G-Tech: Jurnal Teknologi Terapan</i>, 9(4), 2187–2197 oleh Program Studi Rekayasa Keselamatan, Institut Teknologi Kalimantan (Anis Rohmana Malik, Tito Bisma May Wilis, Novita Lizza Anggraini, Athaya Nur Khayyirah, Archangela Adelina, Yifrans Sastra Wiguna) di Institut Teknologi Kalimantan pada tahun 2025–2026.</p> <p>Forum Komunikasi Ilmiah</p> <p>1. Presenter Seminar PRESPECT (Presentation Excellence Training) (2025)</p> <p>Pelatihan</p> <p>1. Pelatihan CV dan Wawancara Sukses</p> <p>2. LKMW-TD V ITK 2024</p> <p>3. Pelatihan Penulisan PKM</p> <p>4. Pelatihan Tecnomatix Jack</p> <p>5. Pelatihan Karya Tulis Ilmiah ITK 2023</p> <p>6. LKMM PRA-TD IX ITK 2023</p> <p>7. Pelatihan Bela Negara 2024</p>
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