

Forensic Science as an Elective in Medical Laboratory Science: A Basis for Curriculum Integration and Innovation

Alliah Mae C. Balala, Hanz Klyne R. Buenavista, Ma. Keziah R. Fabriculan, Audresse Julia C. Galvan, Edhel Joyce C. Hermida, and Jasmin Bea V. Mendoza

Abstract

This study aimed to explore the integration of forensic science as an elective course in the Bachelor of Science in Medical Laboratory Science (BS MT/MLS) curriculum, focusing on its relevance, acceptability, and potential benefits to student competencies and career opportunities. A mixed-method sequential explanatory design was utilized to gather data through survey questionnaires and interviews with administrators (deans/program heads), faculty, students, and alumni from CHED-accredited institutions. Results showed that stakeholders perceived forensic science as relevant to medical laboratory science. They viewed its integration as a means to enrich the curriculum, promote interdisciplinary learning, and expand career opportunities. Participants expressed general acceptance of including forensic science, emphasizing its alignment with emerging trends in healthcare and forensic investigation. Interview findings pointed to the importance of faculty training, resource availability, and administrative support for successful implementation. The study concluded that integrating forensic science could serve as a curriculum innovation that enhances educational quality and graduate readiness. It is recommended that higher education institutions review their curriculum frameworks and implement strategic integration of forensic science, including partnerships with forensic experts and institutions to provide practical, hands-on learning experiences.

Keywords: *forensic science; medical laboratory science; professional elective; curriculum integration; curriculum innovation*

Introduction

Medical Technology (MT), also referred to as Medical Laboratory Science (MLS), is a highly specialized field in healthcare that applies scientific principles, laboratory techniques, and technological innovations to perform diagnostic tests vital to patient care. MLS professionals play a central role in the detection, monitoring, treatment, and prevention of diseases, as their outputs directly influence clinical decision-making and public health outcomes (CHED, 2017, p.5). Given this responsibility, ensuring the accuracy, reliability, and timeliness of laboratory results is paramount.

In the Philippines, the Commission on Higher Education (CHED) regulates the academic and professional training of MT/MLS practitioners through CHED Memorandum Order (CMO) No. 13, series of 2017. The memorandum outlines the core competencies expected of MLS graduates, including proficiency in diagnostic testing, laboratory management, quality assurance, and research. These competencies are delivered through a curriculum encompassing fields such as clinical chemistry, clinical microscopy, hematology, microbiology, serology and immunology, transfusion medicine, and histopathology (CHED, 2017, pp.8–15).

Clinical chemistry, for example, plays a vital role in detecting metabolic and organ-related disorders through biochemical analyses of bodily fluids (Muller, 2022, p.12). Clinical microscopy enables diagnosis of parasitic infections via stool and urine analysis (Ibrahim and Ogunleye, 2020, pp.33–35), while hematology focuses on blood cell analysis essential for identifying conditions such as leukemia and anemia (Fletcher et al., 2020, p.78). Similarly, microbiology contributes to infection control by identifying pathogenic microorganisms (Madigan et al., 2020, p.56), and immunology is integral in diagnosing immune system disorders and monitoring infectious diseases (Murphy and Weaver, 2021, p.102).

Over the years, CHED has introduced significant curricular updates, such as extending clinical internships to twelve months and adding co-requisite courses that address emerging trends in the profession, including Medical Technology Assessment and MLS Seminars (CHED, 2017, p.19). Electives like Molecular Biology and Laboratory Management have also been introduced to allow students to deepen their expertise in specific areas. One such elective—Forensic Science—has gained increasing relevance as the intersection between medical diagnostics and legal investigations becomes more pronounced (Almazan, Cruz, and Tuaño, 2020, pp.88–89).

Forensic science, defined as the application of scientific methods to solve legal issues, plays a key role in identifying criminal suspects, analyzing evidence, and exonerating the innocent. With developments in DNA profiling, toxicology, and trace evidence analysis, forensic science has become increasingly reliant on laboratory-based skills that overlap with those taught in MLS programs (Ramirez and Hood, 2020, p.74). Techniques used in clinical chemistry, serology, and molecular diagnostics are directly transferable to crime scene analysis and forensic pathology (Almazan, Cruz, and Tuaño, 2020, p.91).

Despite this synergy, forensic science remains underrepresented in the formal MLS curriculum. Although CHED recognizes that Registered Medical Technologists (RMTs) may serve in forensic roles such as medico-legal investigators and crime laboratory analysts (CHED, 2017, p.21), the curriculum does not currently provide systematic training in forensic science. This creates a gap, especially for students aspiring to work in legal medicine, forensic toxicology, or DNA forensics (Kaufman et al., 2020, pp.43–45).

Moreover, as crime rates and the complexity of forensic cases increase in Southeast Asia, there is a growing demand for professionals who possess both clinical and forensic expertise (Almazan, Cruz, and Tuaño, 2020, p.93). Experts have called for cross-disciplinary training to bridge this gap and strengthen the forensic capabilities of healthcare systems (Button, 2021, p.67).

This study aims to address the curricular gap by exploring how forensic science can be integrated into the existing Bachelor of Science in Medical Technology/Medical Laboratory Science (BSMT/MLS) curriculum in the Philippines. By proposing a framework for curricular innovation, the study seeks to equip future MLS professionals with foundational forensic skills that enhance their employability and support the country's justice system.

Objectives

This study aims to explore the applicability and relevance of integrating forensic science into the Bachelor of Science in Medical Laboratory Science (BS MT/MLS) curriculum in the Philippines. Specifically, it seeks to:

1. Determine the perceived level of relevance among administrators, faculty, and clinical practitioners toward the integration of forensic science in the BS MT/MLS curriculum
2. Assess the perceived level of acceptability among students and alumni regarding the integration of forensic science in the BS MT/MLS curriculum
3. Identify the strengths, weaknesses, opportunities, and threats (SWOT) in integrating forensic science into the BS MT/MLS curriculum through documentary analysis conducted at LORMA Colleges.

Material and Methods

The study employed a mixed-method convergent parallel design to investigate stakeholder perceptions regarding forensic science as an elective in the BS MLS program. The population included deans, program heads, faculty members, students, and alumni from CHED-accredited institutions across the Philippines. Sampling was conducted using a judgmental and quota-based approach to ensure equal representation. Data collection tools included two researcher-designed and validated questionnaires—one for assessing relevance (targeted at administrators and faculty) and another for measuring acceptability (for students and alumni). Validity testing yielded a score of 3.34 (highly valid), and reliability testing using Cronbach's Alpha returned a coefficient of 0.9292 (very high reliability). Surveys were administered online via

Google Forms, ensuring ethical standards such as informed consent, anonymity, and voluntary participation were maintained. Additionally, a SWOT analysis was conducted through documentary review of institutional materials. Quantitative data were analyzed using R and RStudio, while qualitative data, including open-ended responses, were processed through NVivo for thematic analysis.

Results

The study revealed meaningful insights into the perceived relevance and acceptability of integrating forensic science into the BS Medical Laboratory Science (MT/MLS) curriculum. Administrators, faculty members, and industry professionals evaluated the relevance of forensic science, while students and alumni assessed its acceptability.

Table 1. Relevance of Forensic Science to MT/MLS

Relevance of Forensics to MT/MLS	Mean	Standard Deviation	Verbal Interpretation
R1. Forensic science topics are related to the knowledge and skills required for the professional practice of medical technology/medical laboratory science.	3.44	0.73	Strongly Agree
R2. Incorporating forensic science would make the MT/MLS program more comprehensive and well-rounded.	3.56	0.63	Strongly Agree
R3. The integration of forensic science to the MT/MLS curriculum would enhance students' understanding of practical applications in the field.	3.56	0.63	Strongly Agree
R4. The exposure to forensic science concepts and principles would improve students' critical thinking and problem-solving skills.	3.69	0.48	Strongly Agree
R5. The inclusion of forensic science in the MT/MLS program would make the program more attractive to prospective students.	3.69	0.48	Strongly Agree
R6. The inclusion of forensic science would align with current trends and advancements in the healthcare and legal fields.	3.75	0.45	Strongly Agree
R7. The addition of forensic science to the program would broaden the career opportunities for BS MT/MLS graduates.	3.81	0.40	Strongly Agree
R8. Incorporating forensic science into the MT/MLS program would better prepare students for their future careers.	3.63	0.50	Strongly Agree
Overall Mean	3.64	0.43	Strongly Agree

Table 1 presented the results of the survey conducted among administrators, faculty members, and industry professionals regarding the perceived relevance of forensic science to the BS Medical Technology/Medical Laboratory Science (MT/MLS) curriculum. The overall mean score was 3.64, indicating that respondents strongly agreed that forensic science was highly relevant to the current educational and professional landscape of MT/MLS.

Participants strongly agreed that forensic science topics were related to the knowledge and skills required in professional MT/MLS practice (mean = 3.44). This finding aligned with the idea that forensic science and MLS share core competencies such as laboratory testing, DNA analysis, toxicology, and serological assessments—making integration not only logical but beneficial. Respondents also believed that incorporating forensic science would make the program more

comprehensive and well-rounded (mean = 3.56), and that it would enhance students' understanding of practical applications in the field (mean = 3.56). These results reflected an appreciation for interdisciplinary learning and the increasing demand for MLS graduates who are equipped for both clinical and forensic roles.

Moreover, the highest-rated items emphasized that forensic science could improve students' critical thinking and problem-solving skills (mean = 3.69), and that its inclusion would make the MT/MLS program more attractive to prospective students (mean = 3.69). This supported the idea that students could develop deeper analytical abilities and broaden their academic engagement through exposure to real-world forensic scenarios. Respondents also noted that forensic science aligned well with current trends and advancements in both healthcare and legal fields (mean = 3.75), reinforcing the notion that the elective would not be outdated or redundant, but instead responsive to societal and industry demands.

Significantly, the highest mean score (3.81) was recorded for the statement that the addition of forensic science would broaden career opportunities for graduates. This reflected stakeholders' awareness of growing forensic-related job markets, including roles in medico-legal investigation, forensic toxicology, DNA forensics, and even teaching roles in criminology programs. Lastly, respondents strongly agreed that integrating forensic science would help better prepare students for their future careers (mean = 3.63), implying that the knowledge and skills provided through this elective would translate into more competent, adaptable, and employable graduates.

Collectively, the responses in Table 1 demonstrated a robust endorsement of forensic science as a relevant and strategic addition to the MT/MLS curriculum. The high level of agreement across all items reflected a strong alignment between stakeholder expectations and the envisioned benefits of curriculum innovation through forensic science integration.

Table 2. Acceptability of Students Towards the Integration of Forensic Science to MT/MLS

Acceptability of stakeholders in integrating forensics to the MT/MLS curriculum	Mean	Standard Deviation	Verbal Interpretation
A1. I am amenable to taking additional units for forensic science.	2.94	0.97	Agree
A2. I believe that forensic science and medical technology/medical laboratory science topics are closely related with one another.	3.27	0.70	Strongly Agree
A3. I believe that adding forensic science to the program would enhance my understanding of practical applications in the field and supplement the learnings from my other MT/MLS courses.	3.16	0.90	Agree
A4. I believe that incorporating forensic science would make the BS MLS program of the institution more unique, comprehensive, and well-rounded.	3.12	0.89	Agree
A5. I am interested in learning about the techniques and applications of forensic science within the MLS program.	3.35	0.77	Strongly Agree
A6. I do not worry that integration of forensic science to the MLS program will overcomplicate the program.	2.67	0.91	Agree
A7. The addition of forensic science to the program would broaden my career opportunities in the future.	3.29	0.86	Strongly Agree
A8. I believe that integrating forensic science into the program would better prepare me for my future career as an MT/MLS professional.	3.14	0.85	Agree
Overall Mean	3.12	0.71	Agree

This table presented the perceptions of students and alumni regarding the acceptability of integrating forensic science into the BS MT/MLS curriculum. The results showed that the overall mean score was 3.12, indicating general agreement. Respondents strongly agreed that they were interested in learning about forensic science techniques and applications (mean = 3.35) and believed that its inclusion would broaden their career opportunities (mean = 3.29). These findings suggested that forensic science was perceived not only as a relevant and engaging subject but also as one with practical value for future professional endeavors. Additionally, participants agreed that the integration would enhance their understanding of practical applications and supplement their learning from other MT/MLS courses (mean = 3.16), and that it would contribute to a more comprehensive and well-rounded curriculum (mean = 3.12).

Although respondents showed moderate agreement in terms of being amenable to taking additional units for forensic science (mean = 2.94), they did not express concern that the integration would overcomplicate the existing program (mean = 2.67). This implied a general openness to curricular expansion, provided that it was thoughtfully implemented. These findings reinforced the importance of aligning curriculum innovations with student interests and expectations, and demonstrated a readiness among learners to embrace interdisciplinary learning experiences that can enhance both academic engagement and employability.

Table 3. SWOT Analysis through Documentary Review on the Integration of Forensic Science into the BS MT/MLS Curriculum at LORMA Colleges

Strengths	1. The LORMA Colleges is one of the premier top MT/MLS schools in Region 1 with competitive licensure examination performance, and remains to be the only MT/MLS school in the province of La Union 2. Well-grounded institutional and departmental mission, vision, goals, and objectives and strong support from the school administration 3. Annual constant increase in enrollees in the BS MLS program of the College 4. Well-grounded and implemented retention and attrition policy of the College of Medical Laboratory Science and the institution at large 5. Strong networking and partnership with other educational institutions and industries 6. Strong financial capital of the College being one of the top earners of the institution 7. Graduate tracer studies show several graduates' involvement in forensic science
Weakness	1. Limited existing faculty members with training, expertise, background, and educational qualifications in teaching forensic science 2. Additional training or hiring may be needed to offer the elective effectively 3. Limited laboratory infrastructure and material resources for forensic-specific training (such as PCR machine for genetic testing, LC-tandem-MS for drugs of abuse, and crime scene simulation) 4. Little to no developed/prepared course learning materials (such as reference textbooks, syllabus, topic presentations, laboratory manuals) 5. The BS MT/MLS program of the institution remains to be unaccredited
Opportunities	1. Only several MT/MLS schools in the Philippines offer forensic science in their curriculum, making this a unique offering by the institution 2. The field of MT/MLS continues to grow in eminence and popularity, producing more prospective and target students to enrol in the program 3. Growing demand for forensic experts in both public and private sectors 4. Potential for collaborations with law enforcement, legal, and forensic institutions 5. Integration can serve as groundwork for a future full forensic science program
Threats	1. Possible overcrowding in the curriculum if not managed properly 2. Possible mismatch between student expectations and course content if not well-structured 3. Competition from institutions with dedicated forensic science programs.

Table 3 presented a SWOT analysis of the potential integration of forensic science into the BS MT/MLS curriculum at LORMA Colleges. The strengths identified included the institution's strong academic performance, particularly in licensure exams, its growing student enrollment, financial stability, and established partnerships with industry and educational institutions. These factors positioned LORMA Colleges well to adopt curricular innovations. Importantly, graduate tracer studies indicated alumni involvement in forensic-related roles, suggesting that student interest in this area was not only theoretical but also practical and career-driven.

The weaknesses of integration primarily centered around resource limitations. These included a lack of faculty with formal forensic training, insufficient laboratory infrastructure for specialized forensic procedures (e.g., PCR testing and crime scene simulations), and a shortage of prepared instructional materials. Furthermore, the MT/MLS program at LORMA remained unaccredited, potentially limiting its ability to fully implement and benefit from curricular enhancements.

The opportunities outlined in the analysis were considerable. Few institutions in the Philippines offered forensic science within the MT/MLS curriculum, making it a potential differentiator for LORMA. The growing demand for forensic experts in both public and private sectors, along with the possibility of future collaboration with law

enforcement and forensic agencies, underscored the strategic value of integration. Lastly, the initiative could serve as a stepping stone toward establishing a full degree program in forensic science.

Among the threats, the potential for curriculum overload was noted, particularly if integration was not carefully managed. Mismatches between student expectations and actual course content could result in dissatisfaction, and competition from schools offering specialized forensic programs posed an external risk. These threats highlighted the need for a strategic and phased approach to implementation, with clear communication, proper structuring, and resource alignment.

Table 4. Key Insights on Forensic Science Integration in the BS MT/MLS Program

Themes	Description	Responses
Enhanced Career Prospects	Interview data suggests that respondents see the integration of Forensic Science into the BS MLS curriculum as a way to expand graduates' career opportunities. By gaining medico-legal skills and specialized knowledge in areas such as DNA analysis and toxicology, students may become more versatile and competitive for roles in forensic institutions, law enforcement, and uniformed services. These additional competencies are also considered valuable for managing biological evidence in healthcare environments.	R1Q1, R2Q1, R3Q1, R4Q1, R5Q1, R6Q1, R7Q1, R8Q1, R10Q1, R11Q1, R12Q1, R14Q1, R15Q1, R16Q1
Resource Preparedness Levels	Interview responses indicate that institutions differ in their preparedness for implementing the curriculum change. Some acknowledge the need to train or hire qualified forensic science faculty, while others highlight the importance of acquiring appropriate equipment and materials, which may demand additional funding. Universities that already offer related programs may be better equipped, whereas others might need to enhance their infrastructure to support the integration.	R1Q2, R2Q2, R3Q2, R5Q2, R6Q2, R8Q2, R9Q2, R10Q2, R11Q2, R12Q2, R13Q2, R14Q2, R15Q2, R16Q2
Leadership Support Vital	Respondents emphasized that strong administrative support is essential for successfully integrating forensic science, including funding, faculty training, access to laboratory equipment, and collaboration with forensic institutions and regulatory bodies.	R2Q3, R3Q3, R5Q3, R6Q3, R7Q3, R8Q3, R10Q3
Curriculum Enrichment Potential	Based on the information collected from interviewees, integrating forensic science is seen as a chance to enrich the MLS curriculum, making it more comprehensive and relevant. This may include adding basic forensic principles and showing how current MLS knowledge can be applied in interdisciplinary contexts. Leveraging available university resources and programs could also improve students' learning experiences.	R4Q1, R6Q1, R8Q1, R9Q1, R10Q1, R12Q1, R13Q1, R15Q1
Acknowledgement of Adoption Challenges	Implementing this curriculum change involves key considerations such as resource allocation, managing overlaps with existing courses, evaluating demand for graduates with this skillset, and ensuring institutions can deliver the program while meeting standards. Cultural factors may also influence its feasibility in different settings.	R4Q2, R6Q2, R9Q2, R15Q2, R16Q2

Table 4 synthesized qualitative responses into five key themes that further contextualized the quantitative findings. The first theme, Enhanced Career Prospects, showed that respondents believed forensic science would increase graduate competitiveness and open doors to new roles in medico-legal fields, forensic laboratories, and uniformed services. This reinforced the quantitative result that students saw forensic science as a value-adding elective.

The second theme, Resource Preparedness Levels, reflected varying levels of institutional readiness. While some institutions acknowledged that they had the foundational structure to begin integration, others emphasized the need for investment in training, materials, and equipment. This disparity suggested that while the interest in integration was strong, actual execution would depend on institutional capacity.

The third theme, Leadership Support Vital, emphasized the critical role of administrative commitment. Respondents believed that leadership must actively support the initiative by allocating budgets, facilitating faculty development, and enabling collaborations with external forensic institutions. This confirmed the idea that strategic planning must be top-down and supported at all levels of administration.

The fourth theme, Curriculum Enrichment Potential, highlighted that respondents viewed forensic science as a means to make the curriculum more comprehensive and relevant. They supported embedding basic forensic principles into existing subjects and promoting interdisciplinary applications, which aligned with modern pedagogical approaches.

Lastly, the theme Acknowledgment of Adoption Challenges captured the awareness of practical hurdles, such as resource limitations, curriculum alignment, and institutional culture. These concerns reinforced the need for a phased, data-informed implementation strategy.

Discussion

The findings of this study reveal a strong consensus among key stakeholders—administrators, faculty, students, and alumni—regarding the relevance and acceptability of integrating forensic science into the Bachelor of Science in Medical Laboratory Science (BS MT/MLS) curriculum. Administrators and faculty members overwhelmingly agreed that forensic science is a relevant addition to the MLS curriculum, as it builds upon existing laboratory competencies such as DNA analysis, toxicology, and serology, which are commonly applied in medico-legal investigations. These stakeholders believe that the integration of forensic science would not only enrich the educational experience but also better prepare graduates for interdisciplinary roles in both healthcare and legal environments.

Students and alumni expressed general acceptance of the proposed integration. They acknowledged that forensic science aligns closely with core MLS topics and would provide valuable practical applications. Furthermore, they recognized that the inclusion of forensic content could increase the attractiveness of the program, enhance critical thinking and problem-solving skills, and broaden future career opportunities in

forensic laboratories, law enforcement agencies, and crime scene analysis. Despite concerns regarding potential curriculum overload, respondents indicated interest and willingness to undertake additional units if these offered meaningful educational and professional value.

The SWOT analysis supports these findings, identifying institutional strengths such as administrative support, increasing program enrollment, and strong industry networks. Opportunities lie in the relatively untapped market for forensic education in MLS programs and the growing demand for forensic experts. However, key weaknesses include the lack of forensic-trained faculty and limited laboratory infrastructure, while threats include curriculum crowding and competition from institutions with established forensic science programs. Respondents also emphasized the need for strategic planning, adequate funding, faculty development, and collaboration with forensic institutions to ensure a successful and sustainable integration.

In summary, the integration of forensic science into the MLS curriculum is perceived as both relevant and beneficial, offering significant potential for academic enrichment, skill development, and career advancement. However, its success depends on institutional readiness, resource allocation, and supportive leadership.

Conclusion

The study concludes that there is a high level of perceived relevance and general acceptability of forensic science as an elective in the BS MT/MLS curriculum. Key stakeholders—administrators, faculty, students, and alumni—recognize its potential to enrich academic content, improve practical competencies, and expand employment opportunities in the forensic field. Successful implementation will depend on comprehensive strategic planning that addresses curriculum design, faculty training, resource provision, and institutional support. Institutions are encouraged to benchmark from successful models, involve stakeholders in curriculum development, and establish partnerships with forensic science institutions to enhance hands-on learning experiences.

Acknowledgments

The researchers extend their heartfelt gratitude to Mr. Mark Ericson B. Baladad for his expert guidance and critical insights throughout the research process. Special thanks to the panelists—Dean Josephine C. Milan, Mr. Jose Enrico M. Sumaya, and Mr. Jerome P. Vera—for their constructive feedback and encouragement. We also acknowledge the students, alumni, deans, and faculty members from participating CHED-accredited institutions for their active involvement. To LORMA Colleges – Center for Health Sciences, thank you for supporting our academic growth. Lastly, to our families, friends, and to God Almighty, we are deeply thankful for your unwavering support, wisdom, and protection.

References

- Almazan, J. U., Cruz, J. P., & Tuaño, E. J. (2020). Forensic science education and its role in criminal investigations across Southeast Asia. *Journal of Forensic Sciences*, 65(4), 123-135. <https://doi.org/10.1111/1556-4029.14320>
- American Academy of Forensic Sciences. (2016). The role of medical technologists in forensic science laboratories. <https://www.aafs.org/sites/default/files/media/documents/AAFS-2016-E93.pdf>
- American Society for Clinical Laboratory Science. (2012). Discuss the role of forensic scientists. *Clinical Laboratory Science*, 25(2), American Society for Clinical Laboratory Science. (n.d.). Careers in forensic sciences. <https://ascls.org/careers-in-forensic-sciences/> 107–110.
- Benter, J. B., & Cawi, R. D. (2021). The Appeal of Forensic Science in Higher Education: Increasing Program Attractiveness for Medical Technology Students. SSRN.
- Botch-Jones, S., Thrasher, R. R., Miller, B., Hess, J., & Wagner, J. (2021, May 28). A review of existing forensic laboratory education research and needs assessment: Existing Forensic Laboratory Education research <https://jfse-ojs-tamu.tdl.org/jfse/article/view/43> and Needs assessment.
- Braßler, M. (2020). INTERDISCIPLINARY TEACHING AND LEARNING – THEORY, EMPIRICAL RESULTS, AND PRACTICAL IMPLICATIONS. ICERI2020 Proceedings, 9342–9351. <https://doi.org/10.21125/iceri.2020.2072>
- Buschmann, C. T. (2025). Forensic Science Topics in Medical Laboratory Science Education: Bridging Knowledge and Practical Application. *Forensic Science, Medicine and Pathology*. <https://pmc.ncbi.nlm.nih.gov/articles/PMC107848423/>
- Button L. J. (2021). Chapter 16: Curriculum Innovations. *Curriculum Essentials: A Journey*. Available from: <https://oer.pressbooks.pub/curriculumessentials/chapter/chapter-curriculum-innovations/>
- Camenson, B. (2019). Opportunities in Forensic Science: Career Pathways for Medical Technologists. <https://ascls.org/careers-in-forensic-sciences/>
- CHED Memorandum Order No. 13, Series of 2017. (2017). Policies, Standards, and Guidelines for the Bachelor of Science in Medical Technology/Medical Laboratory Science Program.
- Clark, C., & Kimmons, R. (2023). Cognitive Load Theory. *EdTechnica: The Open Encyclopedia of Educational Technology*. <https://doi.org/10.59668/371.12980>

- Cullen, J. M., & Miller, J. D. (2019). Advances in gene therapy: Current and future perspectives. *Gene Therapy*, 26(3), 115-125. <https://doi.org/10.1038/s41434-019-0024-9>
- Doe, J. (2010). The evolution of forensic microscopy techniques. *Forensic Science Review*, 22(2), 45-60. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=34e69fc483198b6ec_e3a02bc9d96be008033c6b
- Fleming, Ted. (2018). *Mezirow and the Theory of Transformative Learning*. 10.4018/978-1-5225-6086-9.
- Fletcher, P. S., Wong, L., & Chen, J. P. (2020). Advances in hematology: From basic science to clinical practice. *American Journal of Hematology*, 95(3), Francisco, M. (2023). Expanding BS MLS Programs through Forensic Science Integration. <https://ejfs.springeropen.com/articles/10.17186/s41935-023-00375-w> 307-315.
- Funkhouser, R., & Deslich, S. (2020). Integration of Forensic Science in Interdisciplinary Medical Curricula. <https://www.sciencedirect.com/science/article/pii/S1355030622700106X>
- Galante, F., et al. (2023). Enhancing Analytical Thinking through Forensic Science in Medical Curricula. https://www.researchgate.net/publication/3773227638_Enhancing_forensic_education_exploring_the_importance_and_implementation_of_evidence-based_education_system
- George, T. (2023, June 22). Mixed Methods Research | Definition, Guide & Examples. Scribbr. <https://www.scribbr.com/methodology/mixed-methods-research/>
- Gil-Jiménez, P., & Gómez-Moreno, H. (2024). Technology in forensic sciences: Innovation and precision. *MDPI Technologies* <https://doi.org/10.3390/technologies12080120> Journal, 12(8), 120.
- Gupta, R., & Sharma, P. (2024). Emerging trends in forensic science education. *International Journal of Applied Research*, 10(12), 52-56. <https://www.allresearchjournal.com/archives/2024/vol10issue12/PartC/10-12-52-731.pdf>
- Hawthorne, B. S., Vella-Brodrick, D. A., & Hattie, J. (2019). Well-Being as a Cognitive Load Reducing Agent: A Review of the Literature. *Frontiers in Education*, 4. <https://doi.org/10.3389/educ.2019.00121>
- Ibrahim, K. I., & Ogunleye, O. S. (2020). Diagnostic applications of clinical microscopy in parasitology: A review. *Journal of Parasitology Research*, 34(2), 140-145. <https://doi.org/10.1002/paras.3050> Indeed Editorial Team. (2025, April 23). What can you do with a medical laboratory science degree?

Indeed.

<https://www.indeed.com/career-advice/finding-a-job/what-can-you-do-with-medical-laboratory-science-degree>

Julia.Kuzmina. (2024, July 31). Transformative learning. Valamis. 42
<https://www.valamis.com/hub/transformative-learning>

Jones, L. M., & Taylor, R. K. (2019). Advancements in forensic laboratory techniques. *Journal of Forensic Sciences*, 64(10), 1234–1240.
<https://pubmed.ncbi.nlm.nih.gov/31627125/>

Julia.Kuzmina. (2024, July 31). Transformative learning. Valamis.
<https://www.valamis.com/hub/transformative-learning>

Kumar, S., & Patel, R. (2023). The impact of forensic science on modern investigations. *Egyptian Journal of Forensic Sciences*, 13(1), 75.
<https://ejfs.springeropen.com/articles/10.1186/s41935-023-00375-w>

Lodish, H., Berk, A., Zipursky, S. L., Matsudaira, P., Baltimore, D., & Darnell, J. (2019). *Molecular cell biology* (8th ed.). W. H. Freeman and Company.

Madigan, M. T., Martinko, J. M., Bender, K. S., Buckley, D. H., & Stahl, D. A. (2020). *Brock biology of microorganisms* (15th ed.). Pearson Education.

Marshall, W. J., & Bangert, S. K. (2019). *Clinical Chemistry: Metabolic and Molecular Bases of Inherited Disease* (8th ed.). Elsevier.

McCrone Research Institute. (n.d.). The CSI effect and forensic microscopy.
<https://www.mccrone.com/mm/csi-effect-forensic-microscopy/>

Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education*, 1997(74), 5–12.
<https://doi.org/10.1002/ace.7401>

Mishra, K., & Singh, A. (2024). The Role of Forensic Science in Modern Medical Laboratory Education.
<https://www.northwestcareercollege.edu/blog/the-role-of-forensics-in-modern-medical-laboratory-education>

Müller, M. M. (2022). The 60th anniversary of CCLM: Celebrating progress in clinical chemistry 43 and laboratory medicine. *Clinical Chemistry and Laboratory Medicine*, 60(2), 125-135. <https://doi.org/10.1515/cclm-2022-0021>

Murphy, K., & Weaver, C. (2021). *Janeway's immunobiology* (9th ed.). Garland Science.

Nilendu, D. (2024). Enhancing forensic education: exploring the importance and implementation of evidence-based education systems. *Egyptian Journal of Forensic Sciences*, 14(1). <https://doi.org/10.1186/s41935-023-00375-w>

- Pandey, R., & Roy, A. (2024). Practical Applications of Forensic Science in Medical Technology Education. <https://www.sciencedirect.com/science/article/abs/pii/S1752928X19370109X>
- Pfau, R. O. (1991). Medical technologists in forensic science laboratories in the United States. *Laboratory Medicine*, 22(1), 40–44. <https://doi.org/10.1093/labmed/22.1.40>
- Philippine National Police Forensic Group. (2022). Annual report on the status of forensic science in the Philippines. Philippine National Police.
- Primorac, D. (2024). The Overlap of Forensic Science and Medical Laboratory Practices in Higher Education. <https://www.sciencedirect.com/science/article/pii/S13550306220700582>
- Ramirez, R., & Hood, M. (2020). Forensic toxicology: Principles and applications. Wiley.
- Rodak, B. F. (2024). Rodak's Hematology: Clinical Principles and Applications. (7th ed.). Elsevier.
- Scanlan, P. M. (2013). A review of bachelor's degree medical laboratory scientist education and entry level practice in the United States. *EJIFCC*, 24(1), 5–13. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4975349/>
- Scherzer R., Redmond M. (2022). The importance of innovative curriculum design in medical education. *Annals of Allergy, Asthma, and Immunology*. Volume 129, Issue 4, Page 403-404. Available from: [https://www.annallergy.org/article/S1081-1206\(22\)00591-9/fulltext](https://www.annallergy.org/article/S1081-1206(22)00591-9/fulltext)
- Sheikh Osman, F. (2023, May 8). Forensic science vs clinical laboratory science. LinkedIn. <https://www.linkedin.com/pulse/forensic-science-vs-clinical-laboratory-sheikh-osman-s-mls-ascp-/>
- Smith, A. B., & Johnson, C. D. (2015). Forensic science education: Challenges and opportunities. *Journal of Forensic Research*, 6(4), 1000276. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4581008/>
- Smith, J. A. (2013). Integrating forensic science into the undergraduate biology curriculum. *Journal of Microbiology & Biology Education*, 14(2), 162–165. <https://doi.org/10.1128/jmbe.v14i2.562>
- Tortora, G. J., & Derrickson, B. H. (2020). Principles of Anatomy and Physiology. (16th ed.). Wiley.
- Turgeon, M. L. (2021). Immunology and Serology in Laboratory Medicine. (7th ed.). Elsevier.

Appendices

A. Letter of Intent to the Faculty Adviser



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Carlattan, City of San Fernando, La Union, Philippines, 2500
Facebook: @LormaCMLS | E-mail: cmis@lorma.edu



October 18, 2024

Mark Ericson B. Baladad, MMPHA, RMT
Instructor
LORMA College of Medical Laboratory Science
City of San Fernando, La Union 2500
Re: Letter to the Research Adviser

Warm greetings of peace and health!

The undersigned BMLS third year students are interested to conduct a Mixed-Method Sequential Explanatory Research entitled "**Forensic Science in Medical Laboratory Science: A Basis for Curriculum Integration Innovation**". This is in partial fulfillment of the requirements for the course MRESEARCH1: Introduction to Medical Laboratory Science Research 1.

The primary goal of this research is to explore the feasibility and potential benefits of incorporating forensic science into the Medical Laboratory Science (MLS) curriculum at Lorma Colleges. Forensic science offers a unique intersection of disciplines such as biology, chemistry, and criminal investigation, making it highly relevant for MLS students. By integrating forensic science, the MLS program could better align with emerging trends, broaden students' skill sets, and open new career pathways, including roles in forensic laboratories and criminal investigations.

Our research seeks to gather insights from key stakeholders—such as deans, instructors, students, and graduates—regarding the demand, challenges, and applicability of forensic science in the context of MLS education. The study also aims to assess the potential impact of curriculum integration on employability and opportunities for Registered Medical Technologists (RMTs). We believe this study will provide valuable information that can serve as a foundation for developing an innovative curriculum that prepares students to meet the demands of a dynamic and evolving healthcare landscape.

On this regard, we are humbly requesting for your service as our Research Adviser for this study. We believe that your knowledge, expertise, and valuable insights will help us accomplish this endeavor successfully.

Should there be any further questions, concerns, or clarifications, please do not hesitate to reach our lead research proponent:

Name: Hermida, Edhel Joyce C. (BMLS III-1)
Phone number: 09156267572
E-mail: edheljoyce.hermida@lorma.edu

We hope that you will be able to consider our request.

Thank you very much and God bless!

Respectfully yours,


Balala, Allan Mae C.


Buenavista, Hanz Klyne R.


Fabiculana, Ma. Keziah R.


Galvan, Adresse Julia C.


Hermida, Edhel Joyce C.


Mendoza, Jasmin Bea V.

Student Researchers

B. Letter of Intent to Conduct a Study



September 10, 2024

MR. RYAN JAY G. MOSTOLES, MASE, RMT, CT
Chair, LORMA Colleges – Research Ethics Committee
LORMA Colleges, Inc.
Carlatan, City of San Fernando, La Union

RE: **Letter of Intent to Conduct a Study**

GREETINGS!

We, the undersigned, are third-year Bachelor of Science in Medical Laboratory Science students from LORMA Colleges, conducting a research study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**

We are respectfully requesting your permission to conduct this research in your institution and to include eligible participants from your academic community. All findings will be used solely for academic purposes and will be shared upon request.

We hope that you will be able to consider our request.

Thank you very much and God bless!

Respectfully yours,
The researchers of BMLS III- Section 1 group 2

Balala, Allan Mae C.

Buenavista, Hanz Klyne R.

Fabulan, Ma. Keziah R.

Galvan, Audresse Julia C.

Hermida, Edhel Joyce C.

Mendoza, Jasmin Bea V.

Noted by:

Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory (Research Adviser)
Josephine V. Culaton-Milan, MSMT, RMT
Dean, LORMA College of Medical Laboratory Science

C. Contract of Acceptance for Faculty Adviser



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Carlatan, City of San Fernando, La Union, Philippines, 2500
Facebook: @LormaCMLS | E-mail: cmls@lorma.edu



Contract of Acceptance for Faculty Research Adviser

Choosing a research topic and finding an adviser are clearly linked, although, the first precedes the second. The competency and passion of Research Advisers parallel the successful completion of the research initiative.

As per the current standing CMLS Research Manual, only bona fide employees of the LORMA Colleges may be assigned as Research Advisers by the Research Coordinator and Instructor, with the approval of the office of the Dean. Priority for research paper advising will be given to full-time faculty members of the College.

Every member of the faculty must handle at least one (1) research group per Academic Year. A maximum of five (5) groups can be handled by a Faculty Research Adviser to ensure the quality of the outputs.

Lastly, the Faculty Adviser's research interests, expertise, experiences, previous research works/publications, as well as their acceptance, credence, and initiative to help must be considered.

Responsibilities of the Faculty Research Advisers

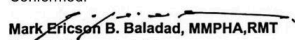
Research is one of the pillars of higher education, alongside instruction and extension. Therefore, it is imperative for faculty members to engage in research activities which would contribute to the current pool of knowledge in the field of medical laboratory science, public health, allied health education, and other related fields.

1. Formulate general and specific questions and decide of the overall direction of the study proposed by the student.
2. Input ideas, monitor, and supervise the progress of the paper.
3. Help resolve group disputes or conflicts and unify the group.
4. Extensively and substantially assist on the data gathering procedure (either during interview, dissemination of questionnaires, experimentation) in Research 2 and writing of the manuscript.
5. Minimize the risk of the study to the research participants by stringently ensuring that all legal and ethical principles are followed and implemented as prescribed by institutional research standards.
6. Contribute on the revisions based on the suggestion and recommendations by the Research Technical Panel and partner institution (if present).
7. Check the completeness, accuracy, validity, and rigor of methodology to be employed and the data gathered.
8. Attend on the proposal and final defense schedules and clarify concepts to the Research Defense Panel if asked to intervene.
9. Obligated to oversee the research paper even after defense (for publication and participation in various fora or academic conferences).

I understand all the terms and conditions stated herein.

Therefore, I fully accept the duties and responsibilities inherent to becoming a Faculty Research Adviser for the research entitled: Forensic Science in Medical Laboratory Science: A Basis for Curriculum Integration Innovation.

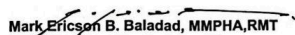
Conformed:


Mark Ericson B. Baladad, MMPHA, RMT

Faculty Research Adviser

Date: October 18, 2024

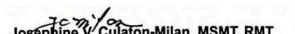
Noted by:


Mark Ericson B. Baladad, MMPHA, RMT

Instructor, Research Lecture and Laboratory


Mark Ericson B. Baladad, MMPHA, RMT

Research Coordinator, LORMA College of Medical Laboratory Science


Josephine V. Culaton-Milan, MSMT, RMT

Dean, LORMA College of Medical Laboratory Science

D. Research Grid



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Center for Health Sciences – Carlatan Campus, City of San Fernando, La Union, Philippines 2500
Facebook: @LormaCMLS | E-mail: cmis@lorma.edu



APPROVAL OF RESEARCH TOPIC Introduction to Medical Laboratory Science Research 1

#	Proposed Title	Brief Overview of Study
Topic 1	FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION	1. Research gap and significance of the study (why conduct the study?): The study addresses a significant gap in the current Bachelor of Science in Medical Laboratory Science (BS MT/MLS) curriculum in the Philippines, which lacks formal integration of forensic science despite its close relevance to the field. While medical laboratory scientists are trained in diagnostic testing and laboratory techniques that overlap with forensic applications, they are not formally equipped to pursue careers in forensic science without additional training. This gap limits both the academic exposure and career opportunities for students interested in roles such as forensic toxicologists or crime lab analysts. Given the rising demand for forensic experts in Southeast Asia and the growing complexity of criminal investigations, the integration of forensic science as an elective course is both timely and essential. This study highlights the importance of curriculum innovation to prepare graduates for interdisciplinary roles that connect healthcare and criminal justice. By introducing forensic science into the MLS curriculum, students can acquire relevant forensic competencies, enhance critical thinking and problem-solving skills, and broaden their professional outlook, ultimately contributing to improved forensic investigations and the administration of justice in the country. 2. Statement of the problem: - What is the perceived level of relevance of forensic science in the BS MT/MLS curriculum among the following stakeholders? - Administrators (Deans and Program Heads/Chairs) - Faculty - What is the perceived level of acceptability towards the integration of forensic science in the BS MT/MLS curriculum among the following stakeholders? - Students - Alumni (Graduates) 3. Proposed population and locale: Target Participants: - Administrators (Deans, Program Heads/Chairs) - Faculty members (Registered Medical Technologists) - Third- and fourth-year BS MT/MLS students - Alumni (graduates within the last 3 years) Eligibility Criteria: - Affiliated with CHED-accredited higher education institutions in the Philippines - Willing to voluntarily participate and provide informed consent - Students must be in their 3rd or 4th year (with adequate program knowledge)



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Center for Health Sciences – Carlatan Campus, City of San Fernando, La Union, Philippines 2500
Facebook: @LormaCMLS | E-mail: cmis@lorma.edu



		- Faculty and administrators must be PRC-licensed Medical Technologists Locale of Study: - Primary data collection centered at LORMA Colleges, San Fernando City, La Union - Additional participants from other schools across the Philippines Sample Size: Quantitative phase: Approximately 50–100 participants Qualitative phase: 6–10 participants (more if needed for data saturation) 3. Data gathering tool and procedure: The study uses a mixed-method approach, starting with online surveys followed by interviews. Ethical approval and informed consent will be secured before data collection. Surveys will be distributed via Google Forms, while interviews will be done face-to-face or online. Confidentiality will be strictly maintained, and a SWOT analysis will support the findings. Tools include validated questionnaires for different participant groups and a semi-structured interview guide. R/RStudio will be used for quantitative analysis, and NVivo for qualitative analysis.
--	--	--

E. Curriculum Vitae



LC-REC Form #003
CV TEMPLATE

CURRICULUM VITAE



BALADAD, MARK ERICSON B.
Academic Medical Technologist

BIONOTE:

Within his five-year professional career, Mr. Baladad has gained backgrounds in medical laboratory science – particularly in clinical parasitology and microbiology, public health, medical research and ethics, allied health education, and healthcare management. Currently, he is the Assistant Dean of the College of Medical Laboratory Science, LORMA Colleges, La Union, Philippines.

I. PERSONAL INFORMATION:

Address : 420 Romas Road, Barangay Paringao, Bauang, La Union
2501 Contact number : 0948 077 7517
Personal email address : sadmarkwrites@gmail.com
Work email address : markericson.baladad@lorma.edu
Date of birth : February 1, 1998
Place of birth : ITRMC, City of San Fernando, La Union

II. EDUCATIONAL QUALIFICATION:

Graduate level:

- Philippine Christian University – *on-going* Doctor of Philosophy in International Healthcare Management (PhD-IHCM), Malate, Manila (*earned 33 units*)
- Hardam Furigay Colleges Foundation, Inc. – *on-going* Master of Arts in Education major in Educational Administration (MAEd) (*earned 27 units*)

- Philippine Christian University – completed Master in Management major in Public Health Administration (MMPHA), Malate, Manila
- Angeles University Foundation – *finished academic units for* Master of Science in Medical Laboratory Science (MSMLS), Angeles City

Post-baccalaureate level:

- Iqra Development Academy of Bangsamoro Administrative Region of Muslim Mindanao – Certificate in Professional Teaching (CPT), Tamparan, Lanao del Sur

Baccalaureate level:

- LORMA Colleges, Inc. – Bachelor of Science in Medical Laboratory Science (BSMLS), Carlatan, City of San Fernando, La Union
- Successfully passed the Medical Technology Licensure Examination in March 2019

III. WORK EXPERIENCES:

Medical Laboratory Science Instructor

LORMA College of Medical Laboratory Science

08/2019 – Present

City of San Fernando, La Union

Achievements/Tasks:

- **College instructor (2019 – Present)**
 - Teaches professional/major and core subjects in medical laboratory science/technology
 - Previous course designation includes Clinical Parasitology, Clinical Microscopy, Research Writing, MLS Seminar I and II, Medical Technology Assessment Program I and II, Health Information Systems, Community and Public Health, Principles of Medical Laboratory Science, and Biochemistry
- **Research Coordinator (2020 – Present)**
 - Disseminate areas of research to the faculty, staff, and students in the College
 - Coordinate research activities within their respective departments
 - Prepare annual research journal and submits the same to the Chairman of Research
 - Prepare and submit annual reports on the research accomplishment of the department
 - Oversees the overall delivery of MLS Research to third year students
 - Serve as a contact person for external affiliation or research collaboration
- **Flexible Online Learning Coordinator (2020 – 2024)**
 - Attend meetings, trainings, and seminars for the HyFlex and Flexible learning program
 - Conducts survey to assess the delivery of the institutional learning modality
 - Provide technical assistance to the faculty and staff of the College
- **Academic Coordinator (2024)**
 - Oversee the academic operations of the College
 - Support and assist the Dean with student matters and concerns
- **Faculty Adviser, LORMA Colleges Red Cross Youth Council (2019 – Present)**
 - Oversees the overall operations and functions of the Council

IV. PROFESSIONAL ORGANIZATION

Pinagpala Publishing Services, Inc.

Editorial Board Member

11/2022 – Present

Philippines

LORMA Colleges Research Ethics Committee (LC-REC)

Reviewer/Member

10/2022 – 2024

Philippines

Biorisk Association of the Philippines, Inc. (BRAP)

Member

7/2022 – Present

Philippines

International Society for Evolutionary Medicine and Public Health (ISEMPH)

Gratis Member - User ID Number: 57661004

1/2021 – Present

Portugal

International Association of Innovation Professionals (IAIP)

Associate Member - User ID Number: 5265

1/2021 – Present

United States of America

The Philippine Society of Parasitology, Inc. (PSP)

Member - Region 1 Chapter

11/2020 – Present

Philippines

LORMA Colleges – Red Cross Youth Council (LC-RCYC)

Faculty Adviser

8/2019 – Present

Philippines

The Microbiology Society

Affiliate Member - Membership Number: C028636

7/2019 – Present

United Kingdom

The Philippine Association for Medical Technologists, Inc. (PAMET)

Member – La Union Chapter

3/2019 – Present

Philippines

Philippine Association of Schools of Medical Technology and Public Health (PASMETH)

Member

3/2019 – Present

V. PUBLICATIONS:

Research projects (in-progress and finished):

- **Title:** Case report: soil-transmitted helminthiasis among school children in a mountainous community

Proponent/s: M. E. B. Baladad *et. al.*

Status: Pre-print

Publication date: May 2024

- **Title:** The association between hyperglycemia and pulmonary tuberculosis
Proponent/s: M. E. B. Baladad *et. al.*
Status: Completed (presented in PAMET Research Forum)
Publication date: September 2024
- **Title:** Entry-level competencies among LORMA College of Medical Laboratory Science graduates: meeting the demands and trends of the profession
Proponent/s: M. E. B. Baladad *et. al.*
Status: Completed (presented in PAMET Research Forum)
Publication date: September 2024
- **Title:** Knowledge, attitude and perception towards Human Papilloma Virus (HPV) vaccination among female commercial sex workers
Proponent/s: M. E. B. Baladad *et. al.*
Status: Completed (presented in 11th Huachiew Chalermprakiet University National and International Conference 2024, Thailand)
Publication date: August 2024
- **Title:** Prevalence and associated-risk factors of helminthiasis among learners of public elementary and high school of City of San Fernando, La Union
In partnership with: Department of Education – City Schools Division of San Fernando, La Union
Proponent/s: LORMA College of Medical Laboratory Science
Status: December 2022 (completed)
- **Title:** Java plum (*Syzygium cumini*) extract as an alternative stain for the modified Kato-katz technique
Proponent/s: M. E. B. Baladad
Status: For research proposal (on-going research)
Start date: August 2023
- **Title:** Graduate tracer study of LORMA Colleges batch 2016-2021
Proponent/s: M. E. B. Baladad, *et. al.*
Journal: LORMA Colleges Institutional Research Journal
Publication date: July 2023 (completed)
- **Title:** Dragon fruit (*Hylocereus costaricensis*) anthocyanin as a natural pH indicator for bacteriologic glucose fermentation test
Proponent/s: M. E. B. Baladad, J. C. Milan
Status: Accepted research proposal (on-going research)
Start date: June 2023
- **Title:** Assessment of the school-based medical laboratory science preceptorship: a basis for program enhancement
Proponent/s: M. E. B. Baladad
Journal: World Interdisciplinary and Notable International Research Journal
ISBN (Epub): 978-621-8278-32-5
Publication date: December 2022 (completed)

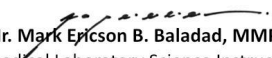
- **Title:** Red dragon fruit (*Hylocerius costaricensis*) flesh aqueous extract as a natural pH indicator
Proponent/s: M. E. B. Baladad, J. C. Milan, A. B. Reyes
Journal: LORMA Colleges Research Journal
Publication date: December 2022 (completed)
- **Title:** Evaluating the awareness of female genital schistosomiasis among women in Ebonyi, Nigeria
Proponent/s: M. E. B. Baladad, et. al.
Journal: Journal of Global Health Science DOI: 10.35500/jghs.2023.5.e20
Publication date: December 2022 (completed)
- **Title:** Flexible online learning in LORMA Colleges during the COVID-19 pandemic
Proponent/s: M. E. B. Baladad, et. al.
Journal: LORMA Colleges Research Journal
- **Title:** Plasma fibrinogen as a potential predictive marker for Alzheimer's Disease: a meta-analysis and systematic review
Proponent/s: M. E. B. Baladad, et. al.
Journal: Unpublished (submitted to the International Journal of Biosciences)
- **Title:** Interns' feedback on the first LORMA College of Medical Laboratory Science virtual internship training program
Proponent/s: M. E. B. Baladad, J. C. Milan
Journal: LORMA College of Medical Laboratory Science Research Journal
ISSN: 2651-706X
- **Worksheet:** Case Analysis Workbook in Clinical Bacteriology
Publisher: Not published (for publishing)
Proponent/s: M. E. B. Baladad
 - It is a comprehensive collection of clinical cases and questions inspired by real-life occurrences referenced in published journal articles from repositories and data bases. This worksheet was mainly written for the Seminar II course of the Medical Laboratory Science students of LORMA Colleges, but was also rendered for students from other schools who will be taking up the course.
- **Worksheet:** Clinical Parasitology Laboratory Manual for Medical Laboratory Science
Publisher: Not published (for publishing)
Proponent/s: M. E. B. Baladad and C. P. Cruz
 - This laboratory guidebook provides the routinely employed basic tests and procedures for the detection of medically important parasites affecting humans.
- **Reviewer:** Microbiology Reviewer
Publisher: Not published (available online – eBook format)
Proponent/s: M. E. B. Baladad
 - An extensive and comprehensive compilation of review notes covering the three major branches of Medical Microbiology: Bacteriology, Mycology and Virology.

VI. REFERENCES

Josephine V. Culaton-Milan, MSMT, RMT
Dean Lorma College of Medical Laboratory Science
Contact detail: josephine.milan@lorma.edu

Marites C. Pagdilao, MAN, MPA, RN
Chair, LORMA Colleges CHS Graduate School and Research Institute
Contact detail: marites.pagdilao@lorma.edu

I hereby declare that all information provided is true and correct. I also understand that any willful dishonesty may render for refusal of this application or immediate termination of employment.


Mr. Mark Ericson B. Baladad, MMPHA, RMT, CPT
Medical Laboratory Science Instructor



CURRICULUM VITAE



BALALA, ALLIAH MAE C.

I. PERSONAL INFORMATION

Address : Sitio Bucao East, Pila Luna, La Union
Contact Number : 0930-741-5567
Email add : *alliahmae.balala@lorma.edu*
Date of Birth : August 16, 2003
Place of Birth : Dagupan City, Pangasinan

II. EDUCATIONAL BACKGROUND

Tertiary Education **Lorma Colleges**
Carlattan, City of San Fernando, La Union
S.Y. 2022-2025 (Present)

Secondary Education **Saint Louis College** (Senior High School)

Carlatan, City of San Fernando, La Union

S.Y. 2020-2022

Sta. Catalina Academy Luna(Junior High School)

Victoria, Luna La Union

S.Y 2016-2020

Primary Education **Pila Elementary School.** Pila Luna La Union

S.Y. 2015-2016

III. AWARDS/CITATIONS/RECOGNITIONS RECEIVED

2008-2020 With Honor

SSG VICE PRESIDENT (2019-2020)

CAT MAJ. WING Logistic Officer (2019-2020)

4TH PLACE MTAP (2015)

IV. WORK EXPERIENCE N/A

V. ELIGIBILITY : N/A

VI. SEMINARS ATTENDED

KADALUBHASAAN Year 4 Annual Webinar Series
December 5, 2024

KADALUBHASAAN Year 4 Annual Webinar Series
July 12, 2024

Cardiopulmonary Resuscitation (CPR) Training, Red Cross La Union Chapter
December 12, 2023

First Aid Training, Red Cross La Union Chapter
December 12, 2023

VII. INVOLVEMENT IN RESEARCH/RESEARCHES CONDUCTED

**FACTORS AFFECTING COLLEGE PROGRAM PREFERENCE OF GRADE 12 STUDENTS
OF SAINT LOUIS COLLEGE** *Co-author (2022)*

**Deworming Campaign Participation Among Children From High STH Prevalence
Area: An Assessment of Local Public Health System Delivery** *Co-author (2025)*

**Toward Eradicating River Blindness: Investigating Epidemiology, Treatment, And
Public Health Barriers In Onchocerca Volvulus Control** *Co-author (2025)*



CURRICULUM VITAE



BUENAVISTA, HANZ KLYNE R.

I. PERSONAL INFORMATION

Address : Sitio Salapi, Brgy. Poblacion Sur Caba, La Union
Contact Number : 0956-396-8462
Email add : *hanklyne.buenavista@lorma.edu*
Date of Birth : February 17, 2004
Place of Birth : Lower Bicutan, Taguig City

II. EDUCATIONAL BACKGROUND

Tertiary Education **Lorma Colleges**
Carlatan, City of San Fernando, La Union
S.Y. 2022-2025 (Present)

Secondary Education **ASSATT Christian School Inc. (Senior High School)**
Raisaville St. San Eugenio, Aringay, La Union
S.Y. 2020-2022

ASSATT Christian School Inc. (Junior High School)
Raisaville St. San Eugenio, Aringay, La Union
S.Y. 2016-2020

Primary Education **Saint John the Baptist Learning Center**
Poblacion Norte Caba, La Union
S.Y. 2013-2016

Saint Augustine School of Naguilian
Ortiz Naguillian, La Union
S.Y. 2012-2013

III. AWARDS/CITATIONS/RECOGNITIONS RECEIVED

Tertiary Education	Lorma Colleges, College of Medical Laboratory Science Academic Dean's Lister First Semester S.Y. 2022-2023 Academic Dean's Lister Second Semester S.Y. 2022-2023 Medtech Quiz: Tagisan ng Talino- Champion
Secondary Education	ASSATT Christian School Inc. With Honors S.Y. 2021-2022 With Honors S.Y. 2020-2021

IV. WORK EXPERIENCE

(SPES) LGU Caba, La Union RHU
Clinic Aide- June-July 2022; June-August 2023

V. ELIGIBILITY : N/A

VI. SEMINARS ATTENDED

KADALUBHASAAN Year 4 Annual Webinar Series
December 5, 2024

KADALUBHASAAN Year 4 Annual Webinar Series
July 12, 2024

Cardiopulmonary Resuscitation (CPR) Training, Red Cross La Union
December 12, 2023

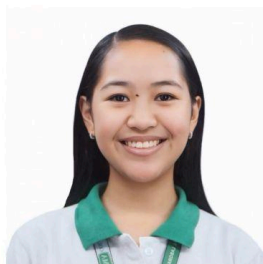
First Aid Training, Red Cross La Union Chapter
December 12, 2023

VII. INVOLVEMENT IN RESEARCH/RESEARCHES CONDUCTED:

Soil-Transmitted Helminthiasis: A Literature Review,
Co-author (2025)



CURRICULUM VITAE



FABICULANAN, MA. KEZIAH R.

I. PERSONAL INFORMATION

Address : #11 P. Florendo St., Ortiz, Naguilian, La Union
Contact Number : 0961-851-5395
Email add : ma.keziah.fabiculanan@lorma.edu
Date of Birth : July 29, 2003
Place of Birth : Baguio City

II. EDUCATIONAL BACKGROUND

Tertiary Education **Lorma Colleges**
Carlatan, City of San Fernando, La Union
S.Y. 2022-2025 (Present)

Secondary Education **Saint Louis College (Senior High School)**
Carlatan, City of San Fernando, La Union
S.Y. 2020-2022

Naguilian National High School (Junior High School)
Imelda, Naguilian, La Union
S.Y. 2016-2020

Primary Education **Saint Augustine School of Naguilian**
Natividad, Naguilian, La Union
S.Y. 2015-2016

Philex Mines Elementary School

Padcal, Tuba, Benguet

S.Y. 2010-2015

III. AWARDS/CITATIONS/RECOGNITIONS RECEIVED

Tertiary Education **Lorma Colleges, College of Medical Laboratory Science**
Academic Dean's Lister First Semester S.Y. 2022-2023

Secondary Education **Saint Louis College (Senior High School)**

With Honors S.Y. 2021-2022

With Honors S.Y. 2020-2021

Naguilian National High School (Junior High School)

Conduct Awardee S.Y. 2019-2020

Science Mover S.Y. 2019-2020

With Honors S.Y. 2019-2020

Conduct Awardee S.Y. 2018-2019

Service Awardee S.Y. 2018-2019

With Honors S.Y. 2018-2019

With Honors S.Y. 2017-2018

With Honors S.Y. 2016-2017

Primary Education **Saint Augustine School of Naguilian**

Merit Awardee (With Honors) S.Y. 2015-2016

Philex Mines Elementary School

Best in EPP S.Y. 2014-2015

With Honors S.Y. 2014-2015

With Honors S.Y. 2013-2014

With Honors S.Y. 2012-2013

With Honors S.Y. 2011-2012

Excellence Awardee (With High Honors) S.Y. 2010-2011

IV. WORK EXPERIENCE: N/A

V. ELIGIBILITY : N/A

VI. SEMINARS ATTENDED

KADALUBHASAAN Year 4 Annual Webinar Series
December 5, 2024

KADALUBHASAAN Year 4 Annual Webinar Series
July 12, 2024

Rizal: His Humanity, Extraordinariness, and Godlike Visions
March 10, 2024

Cardiopulmonary Resuscitation (CPR) Training, Red Cross La Union Chapter
December 12, 2023

First Aid Training, Red Cross La Union Chapter
December 12, 2023

VII. INVOLVEMENT IN RESEARCH/RESEARCHES CONDUCTED:

Commensal vs. Pathogenic: Challenge in Differentiating E.histolytica and other Non-pathogenic Amoeba, Co-author (2025)

Modern Public Health Implications of Trichuris trichiura: A Literature Review, Co-author (2025)

The Current Landscape of Giardiasis in the Philippines: A Literature Review, Co-author (2025)

Strategies Used By High School Teachers in Mitigating Academic Dishonesty, Co-author (2022)

Hope in a Whisk: Baking Stories of Mothers During the Community Quarantine, Co-author (2021)

Hope in a Whisk: Kwentong Paghuhurno ng mga Ina sa Panahon ng Pandemya, Co-author (2021)

Effectiveness of Lemon Juice as a Preservative for Apples, Co-author (2020)



CURRICULUM VITAE



GALVAN, AUDRESSE JULIA C.

I. PERSONAL INFORMATION

Address : Purok 3, Pagudpud, San Fernando City, La Union
Contact Number : 0943-928-4587
Email add : *audressejulia.galvan@lorma.edu*
Date of Birth : July 24, 2004
Place of Birth : San Fernando City, La Union

II. EDUCATIONAL BACKGROUND

Tertiary Education **Lorma Colleges**
Carlattan, City of San Fernando, La Union
S.Y. 2022-2025 (Present)

Secondary Education **Lorma Colleges (Senior High School)**
Urbiztondo, San Juan, La Union
S.Y. 2020-2022

Saint Louis College (Junior High School)
Carlattan, City of San Fernando, La Union
S.Y. 2016-2020

Primary Education **Saint Jude Montessori**
Catbangan, City of San Fernando, La Union
S.Y. 2010-2016

III. AWARDS/CITATIONS/RECOGNITIONS RECEIVED

Tertiary Education	Lorma Colleges, College of Medical Laboratory Science	
	Academic Half Scholar First Semester	S.Y. 2022-2023
Secondary Education	Lorma Colleges (Senior High School)	
	With High Honors	S.Y. 2021-2022
	Citation in APEC International Cyber Academy	S.Y. 2021-2022
	Citation in Research	S.Y. 2021-2022
	Director's Academic Excellence Awardee	S.Y. 2020-2021
	Saint Louis College (Junior High School)	
	With Honors	S.Y. 2019-2020
	Liturgical Awardee	S.Y. 2016-2020
	With Honors	S.Y. 2018-2019
	With Honors	S.Y. 2017-2018
Primary Education	Saint Jude Montessori	
	With Honors	S.Y. 2015-2016
	With Honors	S.Y. 2014-2015
	Liturgical Awardee	S.Y. 2013-2016
	With Honors	S.Y. 2013-2014
	With Honors	S.Y. 2012-2013
	With Honors	S.Y. 2011-2012

IV. WORK EXPERIENCE: N/A

V. ELIGIBILITY : N/A

VI. SEMINARS ATTENDED

KADALUBHASAAN Year 4 Annual Webinar Series
December 5, 2024

Cardiopulmonary Resuscitation (CPR) Training, Red Cross La Union Chapter
December 12, 2023

First Aid Training, Red Cross La Union Chapter
December 12, 2023

Research Seminar
February 28, 2020

Liturgical Service Seminar
August 17, 2019

Linangin Seminar and Workshop Cartooning, Digital Painting, Calligraphy & Poem Writing
September 8, 2018

Newsette Seminar and Screening
July 22, 2018

The Louisian Newsette Journalism seminar and workshop
September 2, 2017

VII. INVOLVEMENT IN RESEARCH/RESEARCHES CONDUCTED:

Modern public health implications of Trichuris trichiura: a literature review, Co-author (2025)

The Current Landscape of Giardiasis in the Philippines: A Literature Review, Co-author (2025)

Commensal vs. Pathogenic: challenge in differentiating E.histolytica and other non-pathogenic amoeba, Co-author (2025)

Through A Victim's Eyes: A Study on Students' Perceptions of Depreciative Remarks and How it Affects their Behavior, Co-author (2022)

The Decline of Filipino Traditional Games due to Online Games, Co-author (2021)

Fruit and Vegetable Scraps as Watering Liquid, Co-author (2020)

Antimicrobial Property of Garlic (Allium sativum) Garlic Pesticide Spray, Co-author (2019)



CURRICULUM VITAE



HERMIDA, EDHEL JOYCE C.

I. PERSONAL INFORMATION

Address : #275 Purok 2, Santiago, Bauang, La Union
Contact Number : 0915-626-7572
Email add : edheljoyce.hermida@lorma.edu
Date of Birth : October 16, 2003
Place of Birth : City of San Fernando

II. EDUCATIONAL BACKGROUND

Tertiary Education **Lorma Colleges**
Carlatan, City of San Fernando, La Union
S.Y. 2022-2025 (Present)

Secondary Education **Christ the King College, Inc.**
Sevilla, City of San Fernando, La Union, San Fernando, Philippines
S.Y. 2016-2022

Primary Education **Christ the King College, Inc.**
P. Gomez Street, San Fernando City, 2500 La Union
S.Y. 2010-2016

III. AWARDS/CITATIONS/RECOGNITIONS RECEIVED

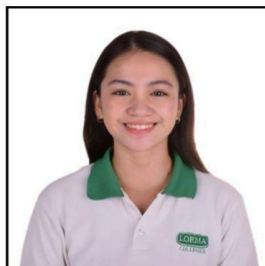
Tertiary Education **Lorma Colleges, College of Medical Laboratory Science**
Academic Half Scholar First Semester S.Y. 2022-2023
Academic Dean's Lister Second Semester S.Y. 2022-2023

Secondary Education **Christ the King College, Inc.**

	Outstanding (With Honors) S.Y. 2021-2022
	Topscore in Scimathalino Quiz Bee (Grade 12) S.Y. 2021-2022
	Loyalty Awardee S.Y. 2021-2022
	Outstanding (With Honors) S.Y. 2020-2021
	Outstanding (With Honors) S.Y. 2019-2020
	Outstanding (With Honors) S.Y. 2018-2019
Primary Education	Outstanding (With Honors) S.Y. 2014-2015
	Outstanding (With Honors) S.Y. 2010-2011
IV. WORK EXPERIENCE	
	Business Owner: E_speciallyforu
	Bauang, La Union
	2020-2022
	Business Administrator: Shodie.vtg
	City of San Fernando La Union
	Present
	Business Co-owner: Nang Talin's Mini Grocery
	Bauang, La Union
	Present
V. ELIGIBILITY :	N/A
VI. SEMINARS ATTENDED	
	KADALUBHASAAN Year 4 Annual Webinar Series
	December 5, 2024
	KADALUBHASAAN Year 4 Annual Webinar Series
	July 12, 2024
	Cardiopulmonary Resuscitation (CPR) Training, Red Cross La Union Chapter
	December 12, 2023
	First Aid Training, Red Cross La Union Chapter
	December 12, 2023
VII. INVOLVEMENT IN RESEARCH/RESEARCHES CONDUCTED	
	<i>Soil-Transmitted Helminthiasis: A Literature Review</i>
	Co-author (2024)
	<i>Benefits and Risks in Investing to Online Cryptocurrency Games</i>
	Co-author (2021-2022)
	<i>The Feasibility of Coffee beans (Coffea Canefora) as a Homemade Varnish</i>
	Co-author (2019-2020)
	<i>Corn Silk (Stigma Maydis) Extract as an Alternative Source in Making Ink</i>
	Co-author (2018-2019)



CURRICULUM VITAE



MENDOZA, JASMIN BEA V.

I. PERSONAL INFORMATION

Address : Daldagan, Galimuyod, Ilocos Sur
Contact Number : 0977-071-0811
Email add : *jasminbea.mendoza@lorma.edu*
Date of Birth : June 10, 2004
Place of Birth : City of Galimuyod, Ilocos Sur

II. EDUCATIONAL BACKGROUND

Tertiary Education : **LORMA Colleges, Bachelor of Medical Laboratory Science**
Carlatan, City of San Fernando, La Union
2022 - Present

Secondary Education : **Saint Louis College**
Carlatan, City of San Fernando, La Union
2020 - 2022

St. Joseph's Institute Inc.
San Juan, Candon City, Ilocos Sur
2016 - 2020

Primary Education : **Galimuyod Integrated School**
Calongbuyan, Galimuyod, Ilocos Sur
2010 - 2016

III. AWARDS/CITATIONS/RECOGNITIONS RECEIVED

Tertiary Education **LORMA Colleges, Bachelor of Medical Laboratory Science**
Academic Half Scholar First Semester - 2022-2023
Academic Dean's Lister Second Semester - 2022-2023

Secondary Education **Saint Louis College (Senior High School)**
 With Honors - 2021-2022
 With Honors - 2020-2021

St. Joseph's Institute Inc. (Junior High School)
 With Honors - 2019-2020
 With Honors - 2018-2019
 With Honors - 2017-2018
 With Honors - 2016-2017

Primary Education **Galimuyod Integrated School**
 First Honorable Mention - 2016
 With Honors - 2015-2016
 With Honors - 2014-2015
 With Honors - 2013-2014
 With Honors - 2012-2013
 With Honors - 2011-2012
 With Honors - 2010-2011

IV. WORK EXPERIENCE : N/A

V. ELIGIBILITY : First Aid Responder, Certified by Red Cross La Union Chapter

VI. SEMINARS ATTENDED

Cardiopulmonary Resuscitation (CPR) Training, Red Cross La Union (2023)

First Aid Training, Red Cross La Union Chapter (2023)

Fostering the Future of Medical Technology - KADALUBHASAAN Webinar Series (2024)

VII. INVOLVEMENT IN RESEARCH/RESEARCHES CONDUCTED

Deworming Campaign Participation Among Children from High STH Prevalence Area: An Assessment of Local Public Health System Delivery
Co-author (2024)

Toward Eradicating River Blindness: Investigating Epidemiology, Treatment, And Public Health Barriers In Onchocerca Volvulus Control
Co-author (2024)

Factors Affecting the Mental Health Status of Grade 12 Students In Saint Louis College
Co-author (2022)

Love Conquers All: Making Weddings Happen in the COVID-19 Pandemic
Co-author (2021)

F. Application for Review Form

January 22, 2025

MS. MARITES C. PAGDILAO, MAN, MPA, RN

Chair, Campus for Health Science – Research Institute

LORMA Colleges, Inc.

Carlatan, City of San Fernando, La Union

SUBJECT: Application for Ethics Review by the LC-REC

Greetings with a LORMA smile!

The undersigned Third Year BS MLS students at the LORMA College of Medical Laboratory Science intends to conduct a study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**.

This study aims to explore how well forensic science could fit into the Bachelor of Science in Medical Technology/Medical Laboratory Science (BS MT/MLS) curriculum as an elective course. We want to understand what different groups—such as administrators, faculty, students, and alumni—think about the relevance and appeal of adding forensic science to their studies. The result of this study will enhance the professional competencies of MLS graduates by equipping them with forensic knowledge and skills.

In light of this, the student researchers would want to apply for ethical review by the LORMA Colleges – Research Ethics Committee.

Your kind approval and acceptance would be invaluable for the conduct of this study. Should there be any questions, please feel free to contact the lead proponent directly.

Name: Edhel Joyce Hermida

E-mail: edheljoyce.hermida@lorma.edu

Mobile number: 0915-626-7572

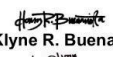
We are respectfully anticipating a favourable reply from you. Advanced thank you for considering our application and we pray that God may continue blessing you and your loving family!

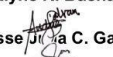
Sincerely,

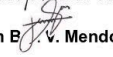

Alliah Mae C. Balala


Ma. Keziah R. Fabriculan


Edhel Joyce C. Hermida


Hanz Klyne R. Buenavista


Audresse J. C. Galvan

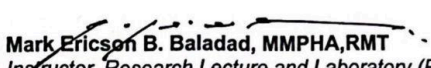

Jasmin B. V. Mendoza

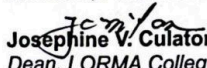
Student Researchers, College of Medical Laboratory Science

Noted by:

Mark Ericson B. Baladad, MMPHA, RMT

Faculty Research Adviser


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory (Research Adviser)


Josephine V. Culaton-Milan, MSMT, RMT
Dean, LORMA College of Medical Laboratory Science

January 22, 2025

MR. RYAN JAY G. MOSTOLES, MASE, RMT, CT

Chair, LORMA Colleges – Research Ethics Committee

LORMA Colleges, Inc.

Carlatan, City of San Fernando, La Union

SUBJECT: Application for Ethics Review by the LC-REC

Greetings with a LORMA smile!

The undersigned Third Year BS MLS students at the LORMA College of Medical Laboratory Science intends to conduct a study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**.

This study aims to explore how well forensic science could fit into the Bachelor of Science in Medical Technology/Medical Laboratory Science (BS MT/MLS) curriculum as an elective course. We want to understand what different groups—such as administrators, faculty, students, and alumni—think about the relevance and appeal of adding forensic science to their studies. The result of this study will enhance the professional competencies of MLS graduates by equipping them with forensic knowledge and skills.

In light of this, the student researchers would want to apply for ethical review by the LORMA Colleges – Research Ethics Committee.

Your kind approval and acceptance would be invaluable for the conduct of this study. Should there be any questions, please feel free to contact the lead proponent directly.

Name: Edhel Joyce Hermida

E-mail: edheljoyce.hermida@lorma.edu

Mobile number: 0915-626-7572

We are respectfully anticipating a favourable reply from you. Advanced thank you for considering our application and we pray that God may continue blessing you and your loving family!

Sincerely,


Alliah Marie C. Balala


Ma. Keziah K. Fabriculan


Edhel Joyce C. Hermida


Hanz Klyne R. Buenavista


Audresse C. Galvan

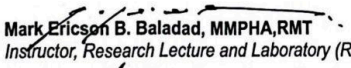

Jasmin B. Mendoza

Student Researchers, College of Medical Laboratory Science

Noted by:

Mark Ericson B. Baladad, MMPHA, RMT

Faculty Research Adviser


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory (Research Adviser)


Josephine V. Culaton-Milan, MSMT, RMT
Dean, LORMA College of Medical Laboratory Science

G. Approval Letter from LORMA Colleges - Review Ethics Committee (LC-REC)



LC-REC Form #024
APPROVAL LETTER
REC Reference #: 2025-047

February 10, 2025

To: Alliah Mae Balala, Hanz Klyne Buenavista, Ma. Keziah Fabriculan, Audresse Julia Galvan, Edhel Joyce Hermida,
and Jasmin Bea Mendoza
LORMA Colleges, College of Medical Laboratory Science

Subject: Approval of the Research Study "FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION" by the Research Ethics Committee (REC).

Dear Researchers,

The Research Ethics Committee (REC) has reviewed your application to conduct the above-mentioned research study in the LOCALE OF STUDY with you as the Principal Investigators within the duration of February 10, 2025 to February 10, 2026.

The Following documents have been reviewed and approved:

1. Letter of Intent to Conduct the Study
2. Endorsement of the Research Technical Panel
3. Title and Statement of the Problem/ Objective
4. Literature Review
5. Methods and Procedures
6. Population and Locale
7. Exclusion/Inclusion Criteria
8. Data Analysis
9. Ethical Considerations

We approve the study to be conducted in the presented form provided the following are integrated in the final research protocol:

1. Revisit the SOP – the third subproblem will be included to produce an output.
2. Indicate the length and frequency of the interview and the number of respondents in each group.
3. In the research paradigm, include "revised / enriched curriculum" as the output.
4. In data gathering procedure, indicate the process of approval secured from heads of other schools and provide the validation result of the questionnaire, also describe further the parts of the questionnaire.
5. State the informed consent form as if researchers are directly communicating with the respondents.

None of the Investigators participating in this study took part in the decision making and voting procedure for this study.

The Institutional REC expects to be informed about the progress of the study, any revision in the protocol before implementation and participants'/respondents' information/informed consent. Likewise, you are required to provide the Board a copy of the final report.

Yours Sincerely,


BEVERLY B. BARUT, RPH

Member, Lorma Colleges-Research Ethics Committee

H. Compliance Report



LORMA COLLEGES
COLLEGE OF MEDICAL LABORATORY SCIENCE
City of San Fernando, 2500 La Union, Philippines



COMPLIANCE REPORT

Research Title: Pathways to Success: Determinants of Employment Outcomes for Medical Laboratory Science Graduates of LORMA Colleges

Date of submission: January 22, 2025

COMMENTS, SUGGESTIONS, & RECOMMENDATIONS	ACTION TAKEN
Background of the Study	
1. Capitalize the word "Chapter I" in the introduction.	The word has been capitalized to CHAPTER I.
2. Fragmentize the long paragraph.	The paragraph has been fragmented (p. 5, paragraph 9).
3. Logical narration of the BOS.	The BOS have been logically arranged (p. 3-9).
Conceptual Framework	
4. Make the total number of graduates a stand-alone input in the research paradigm.	The total number of graduates was separated from the demographics of MLS graduates and listed as an independent category (p. 14).
5. Add to the input of the research paradigm the year of completion of the degree/program, specifically from 2021 to 2024.	The year of completion of the degree/program, specifically from 2021 to 2024, was added to the demographics of MLS graduates (p. 14).
6. Edit the arrow so that it points from the output to the feedback in the research paradigm.	The arrow was adjusted to point from the output to the feedback in the research paradigm (p. 14).
7. Add tangible data to the output of the research paradigm.	Tangible data, such as the perceived level of employability among MLS graduates and their survey responses, were added (p. 14).



LORMA COLLEGES
COLLEGE OF MEDICAL LABORATORY SCIENCE
City of San Fernando, 2500 La Union, Philippines



Statement of the Problem	
8. Change the "employability rate" in question number 1 to the perceived level of employability rate of BMLS graduates of LORMA Colleges from 2021 to 2024.	The "employability rate" in question number 1 was updated to reflect the perceived level of employability rate of BMLS graduates of LORMA Colleges from 2021 to 2024 (p. 15).
Research Design	
9. Capitalize the word "Chapter II" in the methodology.	The word has been capitalized to CHAPTER II.
10. Change the research design to descriptive correlational.	The research design was changed to descriptive correlational.
Population and Locale	
11. Add the inclusion and exclusion (eligibility) criteria.	The inclusion and exclusion (eligibility) criteria were added to the population and locale section.

I. Forensic Science Course Syllabus



LORMA COLLEGE
Campus for Health Sciences, Carlatan, City of San Fernando
La Union 2500 Philippines



College of Medical Laboratory Science

INTRODUCTION TO FORENSIC SCIENCE LECTURE

COURSE TITLE	INTRODUCTION TO FORENSIC SCIENCE
COURSE CODE	FS
PROGRAM	BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCE (BSMLS)
COLLEGE	COLLEGE OF MEDICAL LABORATORY SCIENCE
VERSION	VERSION 1
LAST REVISION DATE	April 2025

TABLE OF CONTENTS

CONTENT	PAGE NUMBER
I. OUTCOME DESCRIPTIONS	
A. Philosophy, Vision, and Mission statements of LORMA Colleges	4
B. Institutional Attributes and Institutional Outcomes	5
C. LORMA Institutional Outcomes vis-a-vis BSMLS Program Outcomes	6
D. BSMLS Program Outcomes vis-a-vis Level Outcomes	8
E. Level Outcomes vis-a-vis Course Outcomes (with IPD)	9
F. Course Outcomes alignment with Program Outcomes, Teaching Strategies, Assessment Methods	10
II. GENERAL INFORMATION SHEET ABOUT INTRODUCTION TO FORENSIC SCIENCE LECTURE	
A. Course Description	11
B. Unit credit/Contact hours	11
C. Course Type	11
D. Placement: Year level/ Semester	11
E. Course Pre-requisite/Course Co-requisite	11
F. Teaching-Learning Methodology	11
G. Course Learning Outcomes	11
III. COURSE CONTENT	

A. Topics	13
B. Assessments	15
C. Timeline	16
IV. COURSE COMPLETION	
A. Resources and Facilities (Include schedule of consultation)	22
B. Assessment (Grading System; Course Requirement)	23
C. Class Management (Attendance; Discipline and Behavior; Channel of Communication)	24
V. ASSESSMENT OF COURSE QUALITY	27
VI. SYLLABUS APPROVAL SHEET	27

3

PROGRAM DESCRIPTION

IA. PHILOSOPHY, VISION, AND MISSION STATEMENTS OF LORMA COLLEGES

PHILOSOPHY We believe in student centered approach to education and management. We believe in achieving a lot with limited resources by knowing what other institutions are doing, adopting, or improving and using that can be applied to the College. We believe that a strong continuing faculty and staff development program in the College is a vital component of the total effort to attain the main goal of the College. We believe in the stability and strength as a base for achieving quality education, relevant to national means and development of the total person. We believe above all that giving honor and glory to God in everything we do, is most important in all official activities of the College. VISION We envision LORMA Colleges as an educational institution with a global perspective emphasizing quality, Christian values, and leadership skills relevant to national development. MISSION To empower students for service anywhere in the world through Christian-inspired, quality-driven, and service-oriented education and training.
--

4

IB. LORMA COLLEGES INSTITUTIONAL GRADUATE ATTRIBUTES & INSTITUTIONAL OUTCOMES

INSTITUTIONAL GRADUATE ATTRIBUTES	INSTITUTIONAL OUTCOMES	
God-loving	IO1	Internalize the Christian values.
	IO2	Model the Christian values in their personal and professional lives.
Decision Makers, Critical and Creative Thinker	IO3	Generate ideas and insights utilizing appropriate judgment in decision-making.
	IO4	Utilize higher order thinking skills in decision making towards innovation and creating new technologies.
	IO5	Apply innovative methods and new technologies to solve different problems and making decisions effectively.
Effective Communicator	IO6	Effectively communicate ideas or knowledge through listening, speaking, reading, writing using culturally appropriate language.
Service-Driven Citizen	IO7	Imbibe the service-oriented to oneself, to one's profession and towards the community.
Reflective Life Long Learner	IO8	Commitment to continuously upgrade one's education through readings, seminars and trainings.
Competent Professional	IO9	Perform exceptional knowledge, skills and right attitude in accomplishing duties and responsibilities beyond acceptable standards.

5

IC. LORMA INSTITUTIONAL OUTCOMES V/S-A-V/S BS MEDICAL LABORATORY SCIENCE PROGRAM OUTCOMES

LEARNING OUTCOMES SPECIFIC TO BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY/MEDICAL LABORATORY SCIENCE
(Reference: CHED MEMO # 13 s 2017)

The graduates have the ability to:

- demonstrate technical competence in the performance of clinical laboratory tests in aid of diagnosis , treatment , and management of diseases vis-a-vis biosafety and waste management;
- demonstrate analytical and critical thinking skills in the workplace;
- engage in the collection, analysis, and projection of health information for improving the healthcare management system;
- demonstrate inter-personal skills, leadership qualities, and ethical practice of the profession;
- apply research skills in relevant areas of Medical Technology/ Medical Laboratory Science practice;
- participate in community-oriented activities;
- engage in life-long learning activities;
- demonstrate effective teaching and communication skills.

6

BS MEDICAL LABORATORY SCIENCE PROGRAM OUTCOMES		INSTITUTIONAL OUTCOMES	VISION	MISSION	PHILOSOPHY
The graduates shall be able to:					
1	embody the qualities of a true Christian dedicated to God and service to mankind;	IO1; IO2	✓	✓	✓
2	demonstrate technical competence in the performance of scientific and clinical tests in aid of diagnosis, treatment, and management of diseases, employing the principles of biosafety and proper waste management;	IO9	✓	✓	✓
3	demonstrate analytical and critical thinking skills in the workplace;	IO3; IO4	✓	✓	✓
4	be proficient in the gathering, analysis, and utilization of health information to contribute to health care delivery system;	IO9	✓	✓	✓
5	communicate effectively in English and Filipino, through oral and written means in conveying ideas, concepts and health information to patients and coworkers in a clinical setting, as well as in academic environment;	IO6	✓	✓	✓
6	display leadership qualities, inter-personal skills, professional and ethical conduct in collaborating with colleagues in the attainment of institutional goals;	IO2; IO9	✓	✓	✓
7	apply research skills in relevant areas to contribute to the development of Medical Technology/Medical Laboratory Science practice;	IO5; IO7	✓	✓	✓
8	participate in community-oriented activities; and	IO7	✓	✓	✓
9	manifest willingness to develop oneself academically and professionally.	IO8	✓	✓	✓

(Reference: Philippine Association of Schools of Medical Technology and Public Health, Inc.)

7

ID. LORMA BSMLS PROGRAM OUTCOMES VIS-A-VIS LEVEL 3 OUTCOMES

BSMLS LEVEL 3 OUTCOMES		BSMLS PROGRAM OUTCOMES								
By the end of Level 3, the student will be able to:		1	2	3	4	5	6	7	8	9
1	Manifest profound knowledge and practical understanding of principles of metabolism of the body, formation of blood cells and body fluids, immune system and disease processes and their diagnosis.		✓	✓	✓	✓	✓	✓	✓	✓
2	Demonstrate adequate skills and competency in the manipulation of laboratory equipment during the performance of qualitative and quantitative laboratory tests and procedures utilizing chemical, hematologic, serologic, parasitological, microscopic, and histopathological methods		✓	✓	✓	✓	✓	✓	✓	✓
3	Perform the proper techniques in the collection, handling, and processing and analyses of specimens with conscious mind on laboratory acquired infection control, quality control/assurance, laboratory safety and proper waste disposal		✓	✓	✓	✓	✓	✓	✓	✓
4	Apply computer capability in the handling of laboratory data and a means of communicating meaningful information to others.		✓	✓	✓	✓	✓	✓	✓	✓
5	Apply skills in data gathering, utilization, management, presentation and writing in research		✓	✓	✓	✓	✓	✓	✓	✓
6	Display analytical and critical thinking skills associated with disease correlations, and solving discrepancies		✓	✓	✓	✓	✓	✓	✓	✓
7	Manifest profound knowledge and application of principles and various laws affecting laboratory operations and management	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	Communicate ideas effectively and fluently in writing, speaking, and presenting using appropriate social and scientific language	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Display proper conduct and behavior at all times in the laboratory as well in dealing and interacting with people inside the workplace and the community.	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Exemplifies the qualities of a responsible Filipino citizen who is law abiding and respectful of the right of others.	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	Show a positive attitude by displaying enthusiasm, interest, and eagerness to learn and share knowledge to fellow students.	✓	✓	✓	✓	✓	✓	✓	✓	✓

8

IE. LEVEL 3 OUTCOMES VIS-A-VIS COURSE COUTCOMES

COURSE INTENDED LEARNING OUTCOMES		BMLS LEVEL 3 OUTCOMES										
At the end of Introduction to Forensic Science lecture, the students will be able to:		LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11
1	demonstrate an understanding of the principles and applications of forensic science within medical laboratory settings;	P	P	P	D	D						
2	explain the ethical responsibilities and legal considerations involved in the handling and analysis of forensic evidence;			P	D	P	D	I		D		
3	apply standard operating procedures to process forensic samples such as blood, body fluids, and tissues;	I	P	P	D	P	D					
4	analyze and interpret laboratory findings to answer medico-legal questions related to criminal cases, deaths, or toxic exposures; and	I	P	P		P	D					
5	recognize the implications of forensic analyses on legal and human outcomes and act responsibly.					P		I	D	D	D	D

Legend: I – basic concepts are merely introduced; P – practiced/performed with supervision; D – demonstrate with mastery

9

IF. COURSE OUTCOMES ALIGNMENT WITH PROGRAM OUTCOMES, TEACHING STRATEGIES, ASSESSMENT METHODS

Code	Course Learning Outcomes	Aligned Program Learning Outcome	Teaching Strategies	Assessment Methods
1	Knowledge and understanding (Cognitive Domain)			
1.1	CO1: demonstrate an understanding of the principles and applications of forensic science within medical laboratory settings;	PO2, PO3, PO4, PO7, PO8	Lecture, Reading Assignment, Group work, Case presentation	Quiz, Examination
2	Skills and application (Psychomotor Domain)			
2.1	CO2: explain the ethical responsibilities and legal considerations involved in the handling and analysis of forensic evidence;	PO2, PO3, PO4, PO7, PO8	Lecture, Reading Assignment, Group work, Case presentation	Quiz, Examination
2.2	CO3: apply standard operating procedures to process forensic samples such as blood, body fluids, and tissues;	PO2, PO3, PO4, PO7, PO8	Lecture, Reading Assignment, Group work, Case presentation	Quiz, Examination
2.3	CO4: analyze and interpret laboratory findings to answer medico-legal questions related to criminal cases, deaths, or toxic exposures;	PO2, PO3, PO4, PO7, PO8	Lecture, Reading Assignment, Group work, Case presentation	Quiz, Examination
3	Attitudes and values (Affective Domain)			
3.1	CO8: recognize the implications of forensic analyses on legal and human outcomes and act responsibly	PO1, PO6, PO9	Lecture, Reading Assignment, Group work, Case presentation	Quiz, Examination

10

GENERAL INFORMATION SHEET ABOUT FORENSIC SCIENCE

IIA. Course Description	This course introduces students to the principles of forensic science within the context of medical laboratory practice. It emphasizes the application of biological, chemical, and analytical techniques to the investigation of crime and medico-legal cases, covering topics from crime scene management to DNA analysis and forensic toxicology.
IIB. Unit Credit and Contact Hours	Lecture: Two (2) units with two (2) contact hours per week
IIC. Course Type	Professional Elective
IID. Placement:	Mid-Year Term, Second Year Level
IIIE. Course Pre-requisite and Co-requisite	Pre-requisite: Anatomy and Physiology with Pathophysiology, Biochemistry Co-requisite: Cytogenetics
IIIF. Teaching-Learning Methodology	Mainly face-to-face lecture with PowerPoint presentation, interactive with question-answer technique, case presentation and analysis, and assignment of advanced topic reading or write-ups
IIIG. Course Learning Outcomes	At the end of the course, the students will be able to: 1. demonstrate an understanding of the principles and applications of forensic science within medical laboratory settings; 2. explain the ethical responsibilities and legal considerations involved in the handling and analysis of forensic evidence; 3. apply standard operating procedures to process forensic samples such as blood, body fluids, and tissues; 4. analyze and interpret laboratory findings to answer medico-legal questions related to criminal cases, deaths, or toxic exposures; and 5. recognize the implications of forensic analyses on legal and human outcomes and act responsibly.

11

Teaching Modes and Contact Hours per Mode

Teaching Mode	☐ Traditional - Mainly, the Introduction to Forensic Science lecture class will operate in a conventional, on-ground (face-to-face) teaching modality. Strategies include lecture (instructor directly presents information to the class), brainstorming/dialogical approach, and assessments – all of which given on-site. ☐ Hybrid/blended - Occasionally, the classes will be conducted through the combination of face-to-face and online modality. Some students may be requested to be in-class, while other will be web-based. This will also include e-learning approaches in conjunction to the traditional approach.
----------------------	---

No.	Mode of Instruction	Contact Hours	Percentage
1	Traditional	29	81%
2	Hybrid/blended	7	19%
		36	100%

Contact Hours per Class Activity

No.	Activity	Contact Hours	Percentage
1	Traditional lecture/discussion (both didactic and collaborative)	18	50%
2	Case presentation and analysis (including journal article study)	3	8%
3	Self-directed learning (through advanced reading assignments, supplementary videos)	4	12%
4	Accomplishment of seatwork or assignment (question for research activities and compendium)	2	5%
5	Assessments (gamification, formal quizzes, and term examinations)	9	25%
		36	100%

12

COURSE CONTENT

1314

Week 4 to 5	7 to 10	Classification of Physical and Biological Evidence	At the end of the module, the students will be able to: 1. Categorize various forms of physical and biological evidence; 2. describe forensic value of different specimen types (blood, hair, fibers); 3. explain presumptive vs confirmatory testing approaches; 4. compare trace vs major evidence and their uses in court; and 5. analyze a fictional case for evidence classification.	☐ Research and read additional information about the topic (online articles or reference textbooks) ☐ Uploading of demonstrational video of laboratory methodologies (videos available from Labster or YouTube).		CLO1 to CLO8
Week 6	11 to 12	PRELIMINARY TERM EXAMINATION				
Week 7 to 11	13 to 22	MLS Techniques in FS including molecular techniques	At the end of the module, the students will be able to: 1. Describe the role of MLS in medico-legal investigations. 2. Identify types of biological specimens collected in forensic contexts. 3. Explain pre-analytical considerations unique to forensic samples. 4. Classify evidence based on injury or death mechanism. 5. Understand chain-of-custody and documentation practices. 6. Identify microbiological tests used in forensic cases.	<u>1. Directive Lecture (Synchronous)</u> ☐ Slide/PowerPoint presentation in a residential/face-to-face setup or with the use of online platforms (GoogleMeet or Zoom) ☐ Didactic questioning ☐ Multimedia/flipped video presentation <u>2. Interactive Instruction (Synchronous)</u> ☐ Gamification ☐ Collaborative discussions	<u>Diagnostic assessments</u> through pre-lesson quiz which will evaluate students' strengths, weaknesses, knowledge and skills before their instruction. <u>Formative assessments</u> through collaborative discussion, brainstorming, and random recitations which will evaluate how the student is learning material throughout the discussion.	CLO1 to CLO8

15

			7. Describe appropriate postmortem sample collection (CSF, tissue, blood). 8. Discuss interpretation of postmortem cultures and PCR. 9. Explain role of serology in sudden deaths. 10. Recognize cases where infections mimic other causes. 11. Describe the steps of forensic DNA profiling. 12. Explain the concept of STRs and PCR. 13. Discuss contamination risks in DNA evidence. 14. Interpret simple electropherogram results. 15. Evaluate the reliability of DNA evidence.	☐ Brainstorming and Reflective discussions ☐ Problem solving and Case study ☐ Mediated laboratory procedure <u>3. Write-ups</u> ☐ Assigned questions for research activities (QFR) ☐ Journal Study ☐ Learning through Didactic videos (Asynchronous) <u>4. Self-directed learning</u> ☐ Research and read additional information about the topic (online articles or reference textbooks) ☐ Uploading of demonstrational video of laboratory methodologies (videos filmed by the CIs in the LCMLS Lab and MT staff in LMC Laboratory, videos available from Labster or YouTube).	<u>Summative assessments</u> through chapter quiz and oral revalida to evaluate how much the students had learned throughout a course.	
--	--	--	--	---	--	--

16

Week 12	23 to 24	MID TERM EXAMINATION				
Week 13 to 17	25 to 34	General Toxicological Screening	At the end of the module, the students will be able to:	1. <u>Directive Lecture (Synchronous)</u> ☐ Slide/PowerPoint presentation in a residential/face-to-face setup or with the use of online platforms (GoogleMeet or Zoom) ☐ Didactic questioning ☐ Multimedia/flipped video presentation	<u>Diagnostic assessments</u> through pre-lesson quiz which will evaluate students' strengths, weaknesses, knowledge and skills before their instruction.	CLO1 CLO8
		Alcohol and Volatile Substances Heavy Metal and Chemical Poisoning	- Describe specimen selection for toxicology (blood, urine, gastric). - Identify common screening tests (immunoassay, TLC, GC-MS). - Discuss test sensitivity and specificity. - Understand chain-of-custody in toxicology. - Recognize limitations of point-of-care drug tests. - Explain blood alcohol concentration (BAC) testing. - Identify enzymatic and chromatographic methods for ethanol. - Discuss specimen stability and preservation. - Describe signs of alcohol-related fatality. - Interpret BAC in forensic vs clinical settings. - Identify lab tests used for arsenic, mercury, lead, cyanide. - Describe appropriate specimen (hair, nails, urine, blood). - Explain analytical methods (AAS, ICP-MS). - Correlate symptom timeline with toxin accumulation.	2. <u>Interactive Instruction (Synchronous)</u> ☐ Gamification ☐ Collaborative discussions ☐ Brainstorming and Reflective discussions ☐ Problem solving and Case study ☐ Mediated laboratory procedure 3. <u>Write-ups</u> ☐ Assigned questions for research (QFR) activities ☐ Journal Study	<u>Formative assessments</u> through collaborative discussion, brainstorming, and random recitations which will evaluate how the student is learning material throughout the discussion. <u>Summative assessments</u> through chapter quiz and oral revalida to evaluate how much the students had learned throughout a course.	

17

			1. Evaluate quality control measures for trace element testing.	☐ Learning through Didactive videos (Asynchronous) 4. <u>Self-directed learning</u> ☐ Research and read additional information about the topic (online articles or reference textbooks) ☐ Uploading of demonstrational video of laboratory methodologies (videos filmed by the CIs in the LCMLS Lab and MT staff in LMC Laboratory, videos available from Labster or YouTube).		
Week 18	35 to 36	FINAL TERM EXAMINATION				

18

COURSE COMPLETION

IVA. LEARNING RESOURCES AND FACILITIES

Reference Textbooks:

- ☐ James, S. H., Nordby, J. J., & Bell, S. (2022). Forensic science: An introduction to scientific and investigative techniques (5th ed.). CRC Press.
- ☐ DiMaio, V. J. M., & DiMaio, D. (2001). Forensic pathology (2nd ed.). CRC Press.
- ☐ Theriot, B. L., & Graeter, L. J. (2019). Clinical laboratory science review (6th ed.).
- ☐ F.A. Davis Company. Lappas, N. T., & Lappas, C. M. (2016). Forensic toxicology: Principles and concepts. Academic Press.
- ☐ Harr, R. R. (2019). Medical laboratory science review (5th ed.).
- ☐ F.A. Davis Company. Reddy, K. S. N., & Murty, O. P. (2017). The essentials of forensic medicine and toxicology (34th ed.). Jaypee Brothers Medical Publishers.
- ☐ Karch, S. B. (2008). Postmortem toxicology of abused drugs. CRC Press.
- ☐ Bell, S. (2012). Forensic chemistry (2nd ed.). Pearson Education.
- ☐ Carter, D. O. (2019). Forensic microbiology (2nd ed.). Wiley-Blackwell.
- ☐ Madea, B. (Ed.). (2014). Handbook of forensic medicine (2nd ed.). Wiley-Blackwell.

Research Journals:

- ☐ Journal of Forensic Sciences American Academy of Forensic Sciences Journal of Forensic Sciences. (n.d.). Wiley. <https://onlinelibrary.wiley.com/journal/15564029>
- ☐ Forensic Science International Forensic Science International. (n.d.). Elsevier. <https://www.journals.elsevier.com/forensic-science-international>
- ☐ International Journal of Legal Medicine International Journal of Legal Medicine. (n.d.). Springer. <https://www.springer.com/journal/414>
- ☐ Journal of Analytical Toxicology Journal of Analytical Toxicology. (n.d.). Oxford Academic. <https://academic.oup.com/jat>
- ☐ Forensic Science, Medicine and Pathology Forensic Science, Medicine and Pathology. (n.d.). Springer. <https://www.springer.com/journal/12024>
- ☐ Forensic Toxicology Forensic Toxicology. (n.d.). Springer. <https://www.springer.com/journal/11419>
- ☐ Forensic Chemistry Forensic Chemistry. (n.d.). Elsevier. <https://www.sciencedirect.com/journal/forensic-chemistry>
- ☐ Journal of Clinical Forensic Medicine (now part of Legal Medicine)
- ☐ Journal of Clinical Forensic Medicine. (n.d.). Elsevier. <https://www.journals.elsevier.com/legal-medicine>
- ☐ Science & Justice The Forensic Science Society Science & Justice. (n.d.). Elsevier. <https://www.journals.elsevier.com/science-and-justice>
- ☐ Legal Medicine Legal Medicine. (n.d.). Elsevier. <https://www.journals.elsevier.com/legal-medicine>

19

Lecture room:	Equipment and materials	Reagents	Waste Disposal
CHS audio-visual room (LC-Theatre) or Founders' Building lecture rooms (FB 301, 302, 303) - A one hundred student capacity, airconditioned, well-ventilated and lit room equipped for face-to-face to hybrid modality conferences	☐ Screen projector or television ☐ Microphone with speaker ☐ Personal laptops and phones for online classes ☐ Internet provider	Not applicable (more applicable in the laboratory class)	☐ Utilization of and waste bins outside or in the vicinity of the lecture room ☐ Practice of proper waste disposal and segregation principles

IVB. ASSESSMENT OF COURSE QUALITY:

Course Requirements	Class Standing (CS)	Term Exam (TE)	Term and Final Course Grades
1. At least 80% class attendance	Class standing consists of: recitation points, assignment ratings, quiz scores	Lecture exams may consists of any of the following types: ☐ Multiple choice questions (MCQ) ☐ True or False or Modified True or False ☐ Headings ☐ Identification ☐ Short essay ☐ Case analysis ☐ Construction of data	Lecture grade computation: $[(\text{CS rating} \times 2) + (\text{Term Exam rating})] / 3$
2. Active class participation and engagement during discussions	Passing criterion: 60% of total score		Lecture grades are expressed up to 2 decimals
3. Properly prepared and on-time submission of written assignments or projects	Computation: $[(\text{Raw score} / \text{Total score}) \times 60] + 40$ CS grades are expressed up to 2 decimals	Passing criterion: 60 % of total score	Combined Lecture and Lab grades Lecture grade = 60% Lab grade = 40% Term Course grade = 100% Grades are expressed up to 2 decimals

20

4. Have taken quizzes and term examination.		Computation: $[(\text{Raw score} / \text{Total score}) \times 60] + 40$ Term exam ratings are expressed up to 2 decimals	Final Course Grade (FCG): Prelim term grade = 30% Mid Term grade = 30% Final Term grade = 40% Final Course Grade = 100% FCG are expressed up to 2 decimals ACCESS grades = are expressed in whole numbers 75.00 – Passed 70.00 – Failed 74.50 up to 74.99 □ 75.00 74.49 and below □ 70.00
5. Students must manifest at least 60% knowledge of the topics presented in class; able to think, interpret and analyze critically; able to construct required summary outline or process flow of the topics covered.			

IVC. CLASS MANAGEMENT

Classroom policies

- Students are encouraged to read the textbook, PowerPoint presentations, and other resources.
- Student Handbook for Rules and regulations on the following:
 - Student conduct and discipline (pp 42-43);
 - Forms of disciplinary action (pp 44-45); and
 - Offenses and their corresponding penalties (pp 45-50)

21

Attendance and Absences

- Attendance is a MUST in all synchronous classes. Attendance is checked and noted.
- There is only 20% allowable absences to be incurred by the student in the whole semester in terms of the total number of hours specified in the class schedule. This is based on the specification made by the CHED.
- In case of foreseen absence, the student is advised to inform the Instructor. The student is held responsible for his/her individual study of the lessons missed during the synchronous period. Notes or PowerPoint are uploaded in the Google Classroom for the section.

Quizzes and Term examinations

- Quizzes may be announced (or unannounced, depending on your Instructor).
- Quizzes and exams are conducted online. Specific instructions are given prior to the examination schedule.
- Quizzes and examinations are time-bound. The time is set uniformly for all the classes. Extension of 5-7 minutes is usually given to accommodate the submission of the responses. Failure to submit the quiz or exam on time will be tantamount to a zero score.
- Concerns that arise during the exam must be notified immediately to your Instructor.
- Failure to take the quiz or examination must be notified to the Instructor and the Dean beforehand. With a valid reason, the student can take a special quiz or exam, provided an admission slip is secured from the Student Affairs Office through Ma'am Josefina (Joyce) Soriano. A written letter of explanation is required to be able to take an admission slip.

Late submission of requirements:

- Requirements like assignments, lab activity reports, case studies and journal reports, and others must be submitted on time. There is adequate time given by the Instructors to accomplish these.
- If there is a valid reason that failure to submit the activity is imminent (for example, due to sickness/ hospitalization), the student should inform the Instructor beforehand.
- Due to late submission, the student is penalized for 5 points for every day of delay. The maximum delay is two days. Delay for a day means 24 hours and a fraction thereof.
- Non-submission of requirements within two days, the student will get zero mark for the assignment or activity. The reason for this is to avoid having an incomplete (INC) mark in the class standing (CS). Requirements are included in the computation of class standing.

Discipline and behavior

- Proper behavior and discipline are expected of the student at all times, especially during synchronous class periods.
- Communicate courteously through messenger or email by identifying yourself with your officially enrolled name, ID number, and year and section.
- Communicate with the Instructors and classmates with respect. Personal attacks, offensive language, and other forms of language that malign the reputation of another person, the Department or the School will be dealt with accordingly based on the LORMA Colleges Code of Discipline.

22

4. The Instructor has the right to dismiss the student from the session and other areas for any disruptive behavior.
5. Access the weekly learning materials on time through Google Classroom.
6. Pay attention during class discussion, and take down notes as necessary.
7. Be ever-present during the synchronous class session from the start to the end of the period; not that one leaves the meeting midway or ahead of time.
8. Accomplish the exit ticket immediately after the class. Answer the questions given in the exit ticket accordingly.
9. Complete the assigned tasks accordingly, submit on time, and meet deadlines seriously.
10. Act and treat everyone professionally at all times.

Academic Dishonesty

1. Academic dishonesty means plagiarized assignments or reports from sources without having cited the original writers or authors.
2. Academic dishonesty happens during quizzes or examinations where answers are shared between or among students, or answers copied from notes, PowerPoint, books, or downloaded from the internet. This is simply stated as cheating.
3. Cheating in the quiz or examination will automatically be given zero for the activity.
4. The student(s) is (are) reported to the SAO. The student will have a record in his/her file. It may result in the non-issuance of a certificate of good moral character during graduation or during his transfer to another school.
5. The student may be suspended for a number of days from the School.
6. Cheating and other forms of academic dishonesty with its corresponding penalty are stipulated in the Code of Discipline, Students' Handbook, LORMA Colleges.

Consultation

Consultation Schedule	Monday to Friday (4:00 PM to 6:00 PM)
Appointment/Contact details	Through Facebook messenger (privately or through official class group chat)
Venue	FB-302 (CMLS Faculty Room)

Professors, instructors, and teaching assistants schedule time outside of the class to meet with students. These are called consultation or office hours. Office hours are arranged schedules when students can meet with the teaching personnel to discuss matters relevant to the course/class. Course-related discussions include asking for extra help, seeking clarification of material presented in class and following up on aspects of the class you find compelling. In addition, consultation hours are avenues for students to clarify about their assessment scores/ratings, grades, and other disciplinary matters relevant to the class. Lastly, other matters such as majors and programs of study, graduation requirements/internships, campus events, and other are also discussed during this time. Although, most professors/teaching personnel do not require that students attend office hours. They expect students to decide for themselves when they need or want to participate.

23

ASSESSMENT OF COURSE QUALITY

Assessment areas	Assessor	Assessment methods
Course organization and design	Dean	Syllabus review Class observation
Effectiveness of teaching	Dean, Faculty, Students	Class observation + Dean's evaluation Peer evaluation Student evaluation of the course
Effectiveness of student assessment	Dean and Faculty	Moderation and verification Checking of the examination matrix (TOS)
Learning outcomes assessment	Dean, Faculty, Students	Student performance in course assessments Student evaluation of the course Long-term evaluation
Quality of learning resources and facilities	Faculty, Students	Student evaluation of the course
Student academic counseling and support	Students	Student evaluation of the course

24

SYLLABUS APPROVAL SHEET

Prepared/contributed by:	Submission date:	Noted and Reviewed by:	Recommending approval:	Approved by:
<u>Name</u> <i>Course Instructor</i>	April 2025	Mark Ericson B. Baladad, MMPHA, RMT Assistant Dean, CMLS	Josephine C. Milan, MSMT, RMT Dean, CMLS	Ellen Mae P. Abiqui, RPh, MS Pharm, CPT® Academic Executive Director, Campus for Health Sciences LORMA Colleges

J. Informed Consent Form



LC-REC Form #011
INFORMED CONSENT FORM

INFORMED CONSENT FORM

INSTRUCTION: Please accomplish the form and ensure that all necessary documents are included in your submission.

GENERAL INFORMATION:

Title of the Study: FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION

REC Code : _____ No. of Study Participants: Approximately 50 to 100

Study Site : City of San Fernando, La Union

Name of Researcher/s: Alliah Mae C. Balala

Hanz Klyne R. Buenavista

Ma. Keziah R. Fabiculanan

Audresse Julia C. Galvan

Edhel Joyce C. Hermida

Jasmin Bea V. Mendoza

Contact Information : Telephone Number: _____ Mobile Number: 09156267572

Fax Number: _____ Email : edheljoyce.hermida@lorma.edu

Name of Institution: Lorma Colleges - Center for Health Sciences

Institution's Address : Carlatan, City of San Fernando, La Union, 2511

Type of Study: ☐ Sponsored Clinical Trial ☐ Biomedical Research

☐ Researcher-Initiated Clinical Trials ☐ Stem Cell Research

☐ Health Operations Research ☐ Genetic Research

☐ Social or Behavioral Research ☒ Others: Educational Research

☐ Public Health or Epidemiologic

Source of Funding : ☒ Self-Funded ☐ Scholarship/Research Grant

☐ Government-Funded ☐ Institution-Funded

☐ Sponsored by Pharmaceutical Company

☐ Others: _____

Duration of the Study: Start Date: August 2024 End Date: May 2025

INTRODUCTION

Medical Technology (MT), also known as Medical Laboratory Science (MLS), is a crucial healthcare field that combines scientific principles, laboratory techniques, and advanced technologies to perform essential diagnostic tests, directly impacting patient care and disease management. MLS professionals are vital to the healthcare system as their work supports the accurate diagnosis, management, treatment, and prevention of diseases. In the Philippines, CHED regulates the MLS curriculum through Memorandum Order No. 13, series of 2017, ensuring professionals are well-equipped to perform a wide range of diagnostic tests and adhere to stringent quality control standards. The curriculum covers key disciplines such as Clinical Chemistry, Clinical Microscopy, Hematology, Microbiology, Immunology, Serology, and Blood Banking, providing comprehensive training in these essential areas. Graduates of MLS programs are well-positioned for careers in forensic science due to their rigorous training in laboratory analysis and diagnostic techniques. CMO No. 13, series of 2017, acknowledges that Registered Medical Technologists (RMTs) can work as medico-legal investigators and forensic scientists in roles such as crime lab analysts, forensic toxicologists, and DNA analysts. Moreover, RMTs can also serve as instructors in criminology programs, sharing their expertise with future criminologists and law enforcement professionals. This research aims to address the curriculum gap by integrating forensic science into MLS programs, thereby enhancing the country's forensic capabilities, improving investigation efficiency, and expanding career opportunities for MLS graduates. The integration of forensic science into the MLS curriculum could produce a new generation of professionals equipped with the skills needed for evidence collection, crime scene analysis, and laboratory investigations, ultimately contributing to faster resolution of criminal cases and the administration of justice.

PURPOSE OF RESEARCH (Use Extra Sheet if Necessary)

The aim of this study is to explore how well forensic science could fit into the Bachelor of Science in Medical Technology/Medical Laboratory Science (BS MT/MLS) curriculum as an elective course. We want to understand what different groups—such as administrators, faculty, students, and alumni—think about the relevance and appeal of adding forensic science to their studies. In order to do this, the researchers will use a mixed-method approach that combines qualitative and quantitative research. This suggests that we will gather both quantitative data and direct observations to provide a complete picture of perspectives. By looking at several points of view, we hope to discover suitable data that will direct curriculum changes and encourage educational innovation. Our ultimate goal is to ensure that the curriculum speaks to the needs and interests of program participants in addition to meeting academic standards.

TYPE OF RESEARCH INTERVENTION

1. Participant Selection

Participants will be selected based on specific criteria, including their background in MT/MLS, clinical practice, public health practice, and education within the City of San Fernando, La Union. Approximately 50 to 100 participants will be recruited using judgmental or probability and quota sampling to ensure equal distribution among respondents. The participants will include deans, program heads, faculty members, students, and graduates of the BS MT/MLS program from various schools in the Philippines.

2. Voluntary Participation

Participation in this study is completely voluntary. Participants are free to decline or withdraw at any point without any repercussions or loss of benefits. The decision to participate or withdraw will not impact any relationship with the researchers, the institution, or any affiliated organizations. Participants will be asked to provide informed consent prior to their involvement in the study.

3. Procedures

A mixed-method sequential explanatory approach will be used, starting with a quantitative survey followed by qualitative interviews. The quantitative phase will gather information on opinions and experiences related to the integration of forensic science using a researcher-made structured questionnaire. The qualitative phase will involve comprehensive interviews to explore themes and challenges identified in the quantitative phase. Data will be collected through Google Forms for surveys and Zoom or GoogleMeet for virtual interviews, ensuring confidentiality and anonymity.

4. Risks

This study involves minimal risk to participants. The potential risks include:

- **Psychological discomfort** due to discussing opinions or personal experiences.
- **Time burden** associated with completing surveys or participating in interviews.

To mitigate these risks, participants will be given the option to skip questions or withdraw if they feel uncomfortable. All efforts will be made to ensure confidentiality and emotional well-being during the research process.

5. Benefits

Participants will contribute to advancements in education and curriculum development, providing valuable insights that will inform decisions for curriculum developers. The integration of forensic science into the MLS

curriculum aims to enhance the country's forensic capabilities, improve investigation efficiency, and expand career opportunities for MLS graduates. Participants will also gain professional growth through their involvement in the study.

6. Reimbursements

Participants who contribute their time to interviews or other data collection activities will be provided with appropriate compensation as a token of appreciation. This may include refreshments for in-person sessions or small incentives such as gift vouchers for virtual participation, ensuring no participant incurs out-of-pocket expenses during the study.

7. Confidentiality

Participants' identities will be anonymized in all survey responses and interview transcripts. Data will be coded to remove personal identifiers before analysis and will be stored securely in password-protected files and encrypted storage devices. Access to the data will be limited to the researchers, ensuring strict privacy and data protection standards. Any publication or presentation of research findings will preserve participant anonymity and confidentiality.

8. Sharing of Results

The results of this study will be shared with participants, stakeholders, and relevant institutions. A summary of findings will be made available through presentations or reports, ensuring accessibility. Participants' identities will remain confidential in all published materials, and no identifying information will be disclosed.

9. Right to Refuse or Withdrawal

Participation in the study will be entirely voluntary, with no coercion or undue pressure applied. Participants will have the freedom to withdraw from the study at any time without facing any consequences. Informed consent will be obtained from all participants, ensuring they fully understand the study's purpose, procedures, and data usage.

10. Who to Contact

For any questions, concerns, or further information about the study, participants can contact:

Edhel Joyce C. Hermida

College of Medical Laboratory Science

LORMA Colleges

Carlatan, City of San Fernando, La Union

Email: edheljoyce.hermida@lorma.edu

Phone: 0915-626-7572

CERTIFICATE OF CONSENT:

I have read the information stated herein or it was properly explained to me. I was provided with a chance to ask questions relative to it. All questions I asked were answered properly; therefore, I consent and voluntarily participate in this study.

Name of Participant: _____

Signature of Participant: _____

Date: _____

Statement from the Researcher/Person Obtaining the Consent

All information pertaining to this study was explained to the possible participant and made sure that he/she fully understood what she/he has to do in the research.

Similarly, I affirm that the potential participant was given with a chance to ask questions which I have answered accurately to the best of my ability.

Likewise, I affirm that the participant was not coerced or forced in giving consent. That he/she has voluntarily provided the consent.

Accomplished by: _____ Date Submitted: _____
(Signature over Printed Name)

K. Letters for Validity Testing



LORMA COLLEGES
Carlatan, City of San Fernando, La Union
COLLEGE OF MEDICAL LABORATORY SCIENCE



February 28, 2025

Ms. Jannier M. Amaro
Registered Medical Technologist
LORMA Medical Center

Dear Ma'am:

Subject: Request for Validation of Research Questionnaire

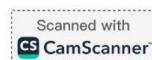
We hope this letter finds you well. We, the undersigned third year students are currently conducting a research study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**. As part of this research, we have developed a questionnaire to gather data from participants.

In light of your expertise in the field of medical laboratory science, we humbly request your assistance in validating our questionnaire. Your input will be invaluable in ensuring the reliability and validity of our instrument.

We have attached the questionnaire along with a brief overview of our study, including the research objectives and methodology. We would greatly appreciate any comments or suggestions you may have to improve the content and structure of our questionnaire.

Your contribution to this study will not only enhance the quality of our research but also support the development of innovative curricula in medical laboratory science.

Thank you for considering our request. We look forward to your positive response and appreciate your time and expertise in this matter.





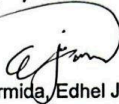
Respectfully yours,


Balala, Alliah Mae C.


Buenaysta, Hanz Klyhe R.


Fabiculan, Ma. Keziah R.


Galvan, Audresse Julia C.


Hermida, Edhel Joyce C.

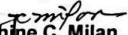

Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory
Date:

Approved by:


Josephine C. Milan, MSMT, RMT
Dean, College of Medical Laboratory Science
Date:



February 28, 2025

Ms. Cindy Sheena P. Ramirez
Registered Medical Technologist
LORMA Medical Center

Dear Ma'am:

Subject: Request for Validation of Research Questionnaire

We hope this letter finds you well. We, the undersigned third year students are currently conducting a research study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**. As part of this research, we have developed a questionnaire to gather data from participants.

In light of your expertise in the field of medical laboratory science, we humbly request your assistance in validating our questionnaire. Your input will be invaluable in ensuring the reliability and validity of our instrument.

We have attached the questionnaire along with a brief overview of our study, including the research objectives and methodology. We would greatly appreciate any comments or suggestions you may have to improve the content and structure of our questionnaire.

Your contribution to this study will not only enhance the quality of our research but also support the development of innovative curricula in medical laboratory science.

Thank you for considering our request. We look forward to your positive response and appreciate your time and expertise in this matter.



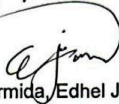
Respectfully yours,


Balala, Alliah Mae C.


Buenaysta, Hanz Klyhe R.


Fabiculan, Ma. Keziah R.


Galvan, Audresse Julia C.


Hermida, Edhel Joyce C.

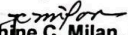

Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory
Date:

Approved by:


Josephine C. Milan, MSMT, RMT
Dean, College of Medical Laboratory Science
Date:



February 28, 2025

Ms. Christalle Anne B. Sandaga
Registered Medical Technologist
LORMA Medical Center

Dear Ma'am:

Subject: Request for Validation of Research Questionnaire

We hope this letter finds you well. We, the undersigned third year students are currently conducting a research study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**. As part of this research, we have developed a questionnaire to gather data from participants.

In light of your expertise in the field of medical laboratory science, we humbly request your assistance in validating our questionnaire. Your input will be invaluable in ensuring the reliability and validity of our instrument.

We have attached the questionnaire along with a brief overview of our study, including the research objectives and methodology. We would greatly appreciate any comments or suggestions you may have to improve the content and structure of our questionnaire.

Your contribution to this study will not only enhance the quality of our research but also support the development of innovative curricula in medical laboratory science.

Thank you for considering our request. We look forward to your positive response and appreciate your time and expertise in this matter.



Respectfully yours,

Balala, Alliah Mae C.

Buenaysta, Hanz Klyhe R.

Fabiculan, Ma. Keziah R.

Galvan, Audresse Julia C.

Hermida, Edhel Joyce C.

Mendoza, Jasmin Bea V.

Student Researchers

Noted by:

Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory
Date:

Approved by:

Josephine C. Milan, MSMT, RMT
Dean, College of Medical Laboratory Science
Date:



February 28, 2025

Ms. Joanna V. Macadaeg
Registered Medical Technologist
LORMA Medical Center

Dear Ma'am:

Subject: Request for Validation of Research Questionnaire

We hope this letter finds you well. We, the undersigned third year students are currently conducting a research study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**. As part of this research, we have developed a questionnaire to gather data from participants.

In light of your expertise in the field of medical laboratory science, we humbly request your assistance in validating our questionnaire. Your input will be invaluable in ensuring the reliability and validity of our instrument.

We have attached the questionnaire along with a brief overview of our study, including the research objectives and methodology. We would greatly appreciate any comments or suggestions you may have to improve the content and structure of our questionnaire.

Your contribution to this study will not only enhance the quality of our research but also support the development of innovative curricula in medical laboratory science.

Thank you for considering our request. We look forward to your positive response and appreciate your time and expertise in this matter.



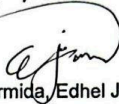
Respectfully yours,


Balala, Alliah Mae C.


Buenaysta, Hanz Klyhe R.


Fabiculan, Ma. Keziah R.


Galvan, Audresse Julia C.


Hermida, Edhel Joyce C.

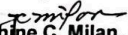

Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory
Date:

Approved by:


Josephine C. Milan, MSMT, RMT
Dean, College of Medical Laboratory Science
Date:



February 28, 2025

Ms. Femari Joy R. Jubilado
Registered Medical Technologist
LORMA Medical Center

Dear Ma'am:

Subject: Request for Validation of Research Questionnaire

We hope this letter finds you well. We, the undersigned third year students are currently conducting a research study entitled: **"FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE: A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION"**. As part of this research, we have developed a questionnaire to gather data from participants.

In light of your expertise in the field of medical laboratory science, we humbly request your assistance in validating our questionnaire. Your input will be invaluable in ensuring the reliability and validity of our instrument.

We have attached the questionnaire along with a brief overview of our study, including the research objectives and methodology. We would greatly appreciate any comments or suggestions you may have to improve the content and structure of our questionnaire.

Your contribution to this study will not only enhance the quality of our research but also support the development of innovative curricula in medical laboratory science.

Thank you for considering our request. We look forward to your positive response and appreciate your time and expertise in this matter.



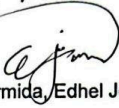
Respectfully yours,


Balala, Alliah Mae C.


Buenavista, Hanz Klyne R.


Fabriciano, Ma. Keziah R.

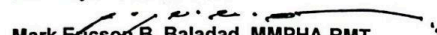

Galvan, Audresse Julia C.


Hermida, Edhel Joyce C.

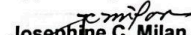

Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory
Date:

Approved by:


Josephine C. Milan, MSMT, RMT
Dean, College of Medical Laboratory Science
Date:

L. Letters for Reliability Testing



LORMA COLLEGES
Carlatan, City of San Fernando, La Union
COLLEGE OF MEDICAL LABORATORY SCIENCE



March __, 2025

BMLS Alumni

Dear Sir/Ma'am:

Subject: Request for Reliability Test of Research Questionnaire

Greetings with a LORMA smile!

We, the undersigned Third Year Bachelor of Science in Medical Laboratory Science students from LORMA College of Medical Laboratory Science, are conducting a study entitled **"Forensic Science as an Elective in Medical Laboratory Science: A Basis for Curriculum Integration"**. As part of this study, we kindly invite you to participate in the reliability testing of the research questionnaire we have developed through google forms.

This research aims to address the gap in the current MLS curriculum by exploring how forensic science can be integrated into existing Bachelor of Science in Medical Technology/Medical Laboratory Science programs. To ensure that our research questionnaire is reliable, we are conducting reliability testing, and your feedback will be instrumental in assessing the consistency and dependability of the questionnaire.

As a participant in the reliability testing, you will be asked to complete the questionnaire and provide feedback on its clarity, ease of understanding, and any areas that may need further improvement. Your valuable input will help us refine the questionnaire and ensure that it can effectively capture the data needed for our study.

Please note that participation is voluntary, and you may withdraw at any time without any consequences. All information you provide will be kept confidential and used solely for the purposes of this study.



Should you have any questions or need further clarification regarding the study or your participation, please do not hesitate to contact the lead researcher:

Name: Edhel Joyce C. Hermida (BMLS III-1)
Phone number: 09156267572
E-mail: edheljoyce.hermida@lorma.edu

Once again, we sincerely thank you for your valuable contribution to this study. Your participation will significantly enhance the quality and credibility of our research.

Thank you for your kind support, and may you continue to be blessed.

Respectfully yours,


Balala, Alliah Mae C.


Buenavista, Franz Klyne R.


Fabiculahan, Ma. Keziah R.

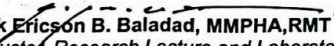

Galvan, Audresse Julia C.

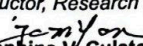

Hermida, Edhel Joyce C.


Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory (Research Adviser)


Josephine V. Culaton-Milan, MSMT, RMT
Dean, LORMA College of Medical Laboratory Science

Conformed:


(Signature over printed name)

(Date signed)



March __, 2025

BMLS Faculty/Dean

Dear Sir/Ma'am:

Subject: Request for Reliability Test of Research Questionnaire

Greetings with a LORMA smile!

We, the undersigned Third Year Bachelor of Science in Medical Laboratory Science students from LORMA College of Medical Laboratory Science, are conducting a study entitled "**Forensic Science as an Elective in Medical Laboratory Science: A Basis for Curriculum Integration**". As part of this study, we kindly invite you to participate in the reliability testing of the research questionnaire we have developed through google forms.

This research aims to address the gap in the current MLS curriculum by exploring how forensic science can be integrated into existing Bachelor of Science in Medical Technology/Medical Laboratory Science programs. To ensure that our research questionnaire is reliable, we are conducting reliability testing, and your feedback will be instrumental in assessing the consistency and dependability of the questionnaire.

As a participant in the reliability testing, you will be asked to complete the questionnaire and provide feedback on its clarity, ease of understanding, and any areas that may need further improvement. Your valuable input will help us refine the questionnaire and ensure that it can effectively capture the data needed for our study.

Please note that participation is voluntary, and you may withdraw at any time without any consequences. All information you provide will be kept confidential and used solely for the purposes of this study.



Should you have any questions or need further clarification regarding the study or your participation, please do not hesitate to contact the lead researcher:

Name: Edhel Joyce C. Hermida (BMLS III-1)

Phone number: 09156267572

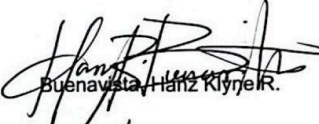
E-mail: edheljoyce.hermida@lorma.edu

Once again, we sincerely thank you for your valuable contribution to this study. Your participation will significantly enhance the quality and credibility of our research.

Thank you for your kind support, and may you continue to be blessed.

Respectfully yours,


Balala, Alliah Mae C.


Buena Vista, Hanz Klyne R.


Fabicularan, Ma. Keziah R.

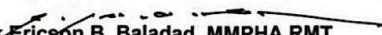

Galvan, Adresse Julia C.

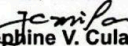

Hermida, Edhel Joyce C.


Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory (Research Adviser)


Josephine V. Culaton-Mitan, MSMT, RMT
Dean, LORMA College of Medical Laboratory Science

Conformed:

(Signature over printed name)

(Date signed)



March __, 2025

BMLS Student

Dear Sir/Ma'am:

Subject: Request for Reliability Test of Research Questionnaire

Greetings with a LORMA smile!

We, the undersigned Third Year Bachelor of Science in Medical Laboratory Science students from LORMA College of Medical Laboratory Science, are conducting a study entitled "**Forensic Science as an Elective in Medical Laboratory Science: A Basis for Curriculum Integration**". As part of this study, we kindly invite you to participate in the reliability testing of the research questionnaire we have developed through google forms.

This research aims to address the gap in the current MLS curriculum by exploring how forensic science can be integrated into existing Bachelor of Science in Medical Technology/Medical Laboratory Science programs. To ensure that our research questionnaire is reliable, we are conducting reliability testing, and your feedback will be instrumental in assessing the consistency and dependability of the questionnaire.

As a participant in the reliability testing, you will be asked to complete the questionnaire and provide feedback on its clarity, ease of understanding, and any areas that may need further improvement. Your valuable input will help us refine the questionnaire and ensure that it can effectively capture the data needed for our study.

Please note that participation is voluntary, and you may withdraw at any time without any consequences. All information you provide will be kept confidential and used solely for the purposes of this study.



Should you have any questions or need further clarification regarding the study or your participation, please do not hesitate to contact the lead researcher:

Name: Edhel Joyce C. Hermida (BMLS III-1)

Phone number: 09156267572

E-mail: edheljoyce.hermida@lorma.edu

Once again, we sincerely thank you for your valuable contribution to this study. Your participation will significantly enhance the quality and credibility of our research.

Thank you for your kind support, and may you continue to be blessed.

Respectfully yours,


Balala, Alliah Mae C.


Buenavista, Hanz Klyde R.


Fabiculan, Ma. Keziah R.

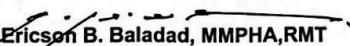

Galvan, Audresse Julia C.

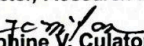

Hermida, Edhel Joyce C.


Mendoza, Jasmin Bea V.

Student Researchers

Noted by:


Mark Ericson B. Baladad, MMPHA, RMT
Instructor, Research Lecture and Laboratory (Research Adviser)


Josephine V. Culaton-Milan, MSMT, RMT
Dean, LORMA College of Medical Laboratory Science

Conformed:

(Signature over printed name)

(Date signed)

M. Validity and Reliability Tools



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Center for Health Sciences – Carlatan Campus, City of San Fernando, La Union, Philippines 2500
Facebook: @LormaCMLS | E-mail: cmis@lorma.edu



SURVEY INSTRUMENT VALIDATION RATING SCALE

Instruction: Please indicate your degree of agreement or disagreement on the statements provided below by encircling the number which corresponds to your best to your judgement.

1 - Strongly Disagree 2 - Disagree 3 - Undecided 4-Agree 5- Strongly Agree

Criteria

Criteria	1	2	3	4	5
The items in the instrument are relevant to answer the objectives of the study.					
The items in the instrument can obtain depth to constructs being measured					
The instrument has an appropriate sample of items for the construct being measured.					
The items and their alternatives are neither too narrow nor limited in its content.					
The items in the instrument are stated clearly.					
The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.					
The terms adapted in the scale are culturally appropriate.					
The layout or format of the instrument is technically good.					
The responses on the scale show a reasonable range of variation.					
The instrument is not too short or long enough that the participants will be able to answer it within a given time.					
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.					
The instrument as a whole could answer the basic purpose for which it is designed.					
The instrument is culturally acceptable when administered in the local setting.					

SAMPLE QUESTIONNAIRE FOR ADMINISTRATORS AND FACULTY

Instruction: Read each question carefully and look closely at answer choices after each question.

Tick or put a mark (✓) into your answer.

Section I. Position

☐ Dean/Program Head/Chair

☐ Faculty

Section II. Relevance of Forensics to MT/MLS:

4 – Strongly agree

3 – Agree

2 – Disagree

1 – Strongly disagree

1. Forensic science topics are related to the knowledge and skills required for the professional practice of medical technology/medical laboratory science.				
2. Incorporating forensic science would make the MT/MLS program more comprehensive and well-rounded.				
3. The integration of forensic science to the MT/MLS curriculum would enhance students' understanding of practical applications in the field.				
4. The exposure to forensic science concepts and principles would improve students' critical thinking and problem-solving skills.				
5. The inclusion of forensic science in the MT/MLS program would make the program more attractive to prospective students.				
6. The inclusion of forensic science would align with current trends and advancements in the healthcare and legal fields.				
7. The addition of forensic science to the program would broaden the career opportunities for BS MT/MLS graduates.				
8. Incorporating forensic science into the MT/MLS program would better prepare students for their future careers.				

GUIDE QUESTION FOR THE INTERVIEW

Question 1. What is the relevance and perceived benefits of integrating forensic science to the current BS MT/MLS curriculum?

Question 2. Will your institution be ready for the integration of forensic science to the current BS MT/MLS curriculum in terms of *a)* faculty number and qualification, *b)* equipment and material resources, *c)* physical infrastructure

Question 3. What are the challenges that might arise from the integration of forensic science to the current BS MLS curriculum?

Question 4. How can the school administrators assist you in adopting forensic science in your BS MT/MLS curriculum

SAMPLE QUESTIONNAIRE FOR STUDENTS AND ALUMNI

Instruction: Read each question carefully and look closely at answer choices after each question. Tick or put a mark (✓) into your answer.

Section I. Position

- ☐ Student
- ☐ Alumni/Graduates

Section II. Acceptability of stakeholders in integrating forensics to the MT/MLS curriculum:

- 4 – Strongly agree
- 3 – Agree
- 2 – Disagree
- 1 – Strongly disagree

1. I am amenable to take additional units for forensic science.				
2. I believe that forensic science and medical technology/medical				

laboratory science topics are closely related with one another.				
3. I believe that adding forensic science to the program would enhance my understanding of practical applications in the field and supplement the learnings from my other MT/MLS courses.				
4. I believe that incorporating forensic science would make the BS MLS program of the institution more unique, comprehensive, and well-rounded.				
5. I am interested in learning about the techniques and applications of forensic science within the MLS program.				
6. I do not worry that integration of forensic science to the MLS program will overcomplicate the program.				
7. The addition of forensic science to the program would broaden my career opportunities in the future.				
8. I believe that integrating forensic science into the program would better prepare me for my future career as an MT/MLS professional.				

N. Results of Validity Testing

SURVEY INSTRUMENT VALIDATION RATING: SUMMARY						
CRITERIA	VALIDATOR 1	VALIDATOR 2	VALIDATOR 3	VALIDATOR 4	VALIDATOR 5	AVERAGE
The items in the instrument are relevant to answer the objectives of the study.	3	4	4	4	4	3.80
The items in the instrument can obtain depth to constructs being measured.	4	4	4	4	4	4.00
The instrument has an appropriate sample of items for the construct being measured.	3	4	4	4	3	3.60
The items and their alternatives are neither too narrow nor limited in its content.	3	4	4	4	3	3.60
The items in the instrument are stated clearly.	4	4	4	4	4	4.00
The items on the instrument can elicit responses which are stable, definite, consistent, and not conflicting.	3	4	4	4	3	3.60
The terms adapted in the scale are culturally appropriate.	3	4	4	5	4	4.00
The layout or format of the instrument is technically sound.	4	4	4	5	4	4.20
The responses on the scale show a reasonable range of variation.	4	4	4	5	4	4.20
The instrument is not too short or long enough that the participants will be able to answer it within a given time.	4	4	4	4	4	4.00
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.	4	4	5	4	3	4.00
The instrument as a whole could answer the basic purpose for which it is designed.	4	4	5	4	4	4.20
The instrument is culturally acceptable when administered in the local setting.	3	4	5	4	4	4.00
GENERAL WEIGHTED MEAN						3.94
<i>Interpretation</i>						<i>Highly Valid</i>



SURVEY INSTRUMENT VALIDATION RATING SCALE

Instruction: Please indicate your degree of agreement or disagreement on the statements provided below by encircling the number which corresponds to your best to your judgment.

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

Criteria	1	2	3	4	5
The items in the instrument are relevant to answer the objectives of the study.	1	2	3	4	5
The items in the instrument can obtain depth to constructs being measured.	1	2	3	4	5
The instrument has an appropriate sample of items for the construct being measured.	1	2	3	4	5
The items and their alternatives are neither too narrow nor limited in its content.	1	2	3	4	5
The items in the instrument are stated clearly.	1	2	3	4	5
The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	1	2	3	4	5
The terms adapted in the scale are culturally appropriate.	1	2	3	4	5
The layout or format of the instrument is technically sound.	1	2	3	4	5
The responses on the scale show a reasonable range of variation.	1	2	3	4	5
The instrument is not too short or long enough that the participants will be able to answer it within a given time.	1	2	3	4	5
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.	1	2	3	4	5
The instrument as a whole could answer the basic purpose for which it is designed.	1	2	3	4	5
The instrument is culturally acceptable when administered in the local setting.	1	2	3	4	5



LORMA COLLEGES
Carlatan, City of San Fernando, La Union
COLLEGE OF MEDICAL LABORATORY SCIENCE



Comments and Suggestions:

Signature over Printed Name


JOANNAY. NABADAO, RMT
PRC 0093474

SURVEY INSTRUMENT VALIDATION RATING SCALE by Ryan Michael F. Oducado
West Visayas State University, College of Nursing



SURVEY INSTRUMENT VALIDATION RATING SCALE

Instruction: Please indicate your degree of agreement or disagreement on the statements provided below by encircling the number which corresponds to your best to your judgment.

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

Criteria

The items in the instrument are relevant to answer the objectives of the study.	1	2	3	4	5
The items in the instrument can obtain depth to constructs being measured.	1	2	3	4	5
The instrument has an appropriate sample of items for the construct being measured.	1	2	3	4	5
The items and their alternatives are neither too narrow nor limited in its content.	1	2	3	4	5
The items in the instrument are stated clearly.	1	2	3	4	5
The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	1	2	3	4	5
The terms adapted in the scale are culturally appropriate.	1	2	3	4	5
The layout or format of the instrument is technically sound.	1	2	3	4	5
The responses on the scale show a reasonable range of variation.	1	2	3	4	5
The instrument is not too short or long enough that the participants will be able to answer it within a given time.	1	2	3	4	5
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.	1	2	3	4	5
The instrument as a whole could answer the basic purpose for which it is designed.	1	2	3	4	5
The instrument is culturally acceptable when administered in the local setting.	1	2	3	4	5



Comments and Suggestions:

Signature over Printed Name

CINDY RAMIREZ

SURVEY INSTRUMENT VALIDATION RATING SCALE by Ryan Michael F. Oducado
West Visayas State University, College of Nursing



SURVEY INSTRUMENT VALIDATION RATING SCALE

Instruction: Please indicate your degree of agreement or disagreement on the statements provided below by encircling the number which corresponds to your best to your judgment.

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

Criteria

The items in the instrument are relevant to answer the objectives of the study.	1	2	3	4	5
The items in the instrument can obtain depth to constructs being measured.	1	2	3	4	5
The instrument has an appropriate sample of items for the construct being measured.	1	2	3	4	5
The items and their alternatives are neither too narrow nor limited in its content.	1	2	3	4	5
The items in the instrument are stated clearly.	1	2	3	4	5
The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	1	2	3	4	5
The terms adapted in the scale are culturally appropriate.	1	2	3	4	5
The layout or format of the instrument is technically sound.	1	2	3	4	5
The responses on the scale show a reasonable range of variation.	1	2	3	4	5
The instrument is not too short or long enough that the participants will be able to answer it within a given time.	1	2	3	4	5
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.	1	2	3	4	5
The instrument as a whole could answer the basic purpose for which it is designed.	1	2	3	4	5
The instrument is culturally acceptable when administered in the local setting.	1	2	3	4	5



Comments and Suggestions:

Signature over Printed Name

Christelle Marie B. Sanjaan
~~Christelle Marie B. Sanjaan~~

SURVEY INSTRUMENT VALIDATION RATING SCALE by Ryan Michael F. Oducado
West Visayas State University, College of Nursing



SURVEY INSTRUMENT VALIDATION RATING SCALE

Instruction: Please indicate your degree of agreement or disagreement on the statements provided below by encircling the number which corresponds to your best to your judgment.

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

Criteria					
The items in the instrument are relevant to answer the objectives of the study.	1	2	3	4	5
The items in the instrument can obtain depth to constructs being measured.	1	2	3	4	5
The instrument has an appropriate sample of items for the construct being measured.	1	2	3	4	5
The items and their alternatives are neither too narrow nor limited in its content.	1	2	3	4	5
The items in the instrument are stated clearly.	1	2	3	4	5
The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	1	2	3	4	5
The terms adapted in the scale are culturally appropriate.	1	2	3	4	5
The layout or format of the instrument is technically sound.	1	2	3	4	5
The responses on the scale show a reasonable range of variation.	1	2	3	4	5
The instrument is not too short or long enough that the participants will be able to answer it within a given time.	1	2	3	4	5
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.	1	2	3	4	5
The instrument as a whole could answer the basic purpose for which it is designed.	1	2	3	4	5
The instrument is culturally acceptable when administered in the local setting.	1	2	3	4	5



LORMA COLLEGES
Carlatan, City of San Fernando, La Union
COLLEGE OF MEDICAL LABORATORY SCIENCE



Comments and Suggestions:

Signature over Printed Name

Jovan R. J. J. J.

SURVEY INSTRUMENT VALIDATION RATING SCALE by Ryan Michael F. Oducado
West Visayas State University, College of Nursing



SURVEY INSTRUMENT VALIDATION RATING SCALE

Instruction: Please indicate your degree of agreement or disagreement on the statements provided below by encircling the number which corresponds to your best to your judgment.

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

Criteria					
The items in the instrument are relevant to answer the objectives of the study.	1	2	3	4	5
The items in the instrument can obtain depth to constructs being measured.	1	2	3	4	5
The instrument has an appropriate sample of items for the construct being measured.	1	2	3	4	5
The items and their alternatives are neither too narrow nor limited in its content.	1	2	3	4	5
The items in the instrument are stated clearly.	1	2	3	4	5
The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	1	2	3	4	5
The terms adapted in the scale are culturally appropriate.	1	2	3	4	5
The layout or format of the instrument is technically sound.	1	2	3	4	5
The responses on the scale show a reasonable range of variation.	1	2	3	4	5
The instrument is not too short or long enough that the participants will be able to answer it within a given time.	1	2	3	4	5
The instrument is interesting such that participants will be induced to respond to it and accomplish it fully.	1	2	3	4	5
The instrument as a whole could answer the basic purpose for which it is designed.	1	2	3	4	5
The instrument is culturally acceptable when administered in the local setting.	1	2	3	4	5



Comments and Suggestions:

- ① Questions are clearly worded and can easily be understood by the target audience.
- ② Make sure that the questions listed contribute to answering the research questions.

Signature over Printed Name

JANNIERY M. AMARO

*SURVEY INSTRUMENT VALIDATION RATING SCALE by Ryan Michael F. Oducado
West Visayas State University, College of Nursing*

O. Results of Reliability Testing

STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5	STUDENT 6	STUDENT 7	STUDENT 8	STUDENT 9	STUDENT 10
2	3	4	3	3	2	4	4	3	3
3	4	4	3	3	3	4	4	4	3
3	4	4	3	2	3	4	4	4	3
4	4	4	4	4	4	4	3	4	4
2	4	4	3	2	2	4	3	4	3
2	3	3	3	3	2	4	3	4	3
4	4	4	3	3	4	4	4	4	4
3	3	3	4	3	3	4	4	4	3
STING RATING: SUMMARY OF ALUMNI									
ALUMNUS 1	ALUMNUS 2	ALUMNUS 3	ALUMNUS 4	ALUMNUS 5	ALUMNUS 6	ALUMNUS 7	ALUMNUS 8	ALUMNUS 9	ALUMNUS 10
4	4	4	3	1	3	4	3	4	2
4	4	4	2	1	3	4	2	3	1
4	4	4	2	1	2	3	2	3	2
4	4	4	3	1	3	4	2	4	1
4	4	4	2	1	3	3	4	4	2
4	4	4	2	1	3	3	2	4	1
4	4	4	2	4	4	4	3	4	1
4	4	4	2	2	3	4	2	3	1

FACULTY 1	FACULTY 2	FACULTY 3	FACULTY 4	FACULTY 5	FACULTY 6	FACULTY 7	FACULTY 8	FACULTY 9	FACULTY 10
4	4	3	3	4	3	3	3	3	3
3	4	3	3	3	3	4	4	2	3
2	4	3	2	3	3	3	4	2	4
4	4	4	4	4	4	4	3	3	4
4	4	4	4	3	3	4	4	3	4
4	4	4	4	3	4	4	4	3	4
4	4	4	4	4	4	4	4	3	3
4	4	4	3	3	4	3	3	2	3

Item	raw_alpha	std.alpha	G6.smc	average_r	S.N	alpha.se	var.r	med.r
Question0	0.923455	0.923049	0.945511	0.631486	11.9952	0.020849	0.01626	0.64704
Question0	0.908427	0.907723	0.925333	0.584247	9.836926	0.024707	0.015346	0.578235
Question0	0.922883	0.921914	0.938731	0.627785	11.80635	0.020751	0.016558	0.662442
Question0	0.919773	0.918739	0.945177	0.617611	11.30599	0.021607	0.018656	0.64704
Question0	0.922694	0.921979	0.93476	0.627996	11.817	0.020618	0.015439	0.64704
Question0	0.912948	0.912339	0.929648	0.597878	10.40764	0.023555	0.01704	0.607701
Question0	0.931017	0.931227	0.947653	0.65921	13.5405	0.019079	0.009714	0.673657
Question0	0.916107	0.914612	0.93775	0.60477	10.71121	0.02244	0.018235	0.605368

Item	V1
raw_alpha	0.929234
std.alpha	0.928522
G6(smc)	0.951234
average_r	0.618873
S/N	12.99037
ase	0.018903
mean	3.291667
sd	0.687271
median_r	0.631521

P. General Research Time Table



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Campus for Health Sciences, Carlatan, City of San Fernando, La Union, Philippines,
2500 Facebook: @LormaCMLS | E-mail: cmls@lorma.edu



GENERAL RESEARCH TIMETABLE/GANTT CHART

Title of the study: Forensic Science as an Elective in Medical Laboratory Science: A Basis for Curriculum Integration and Innovation

Proponent: Edhel Joyce C. Hermida, Alliah Mae C. Balala, Hanz Klyne R. Buenavista, Ma. Keziah R. Fabiculanan, Audresse Julia C. Galvan, Jasmin Bea V. Mendoza

Timetable	Research Task	Status
August 2024	Construction of the research title proposal - Research topic(s) - Recognition of research gaps and objectives - Literature Review - Theoretical and Conceptual framework - Survey and validation of research methodologies to be performed	Completed
September 2, 2024	Title Defense	Completed
September 9, 2024	Construction of Chapter 1 and Chapter 2 of the research manuscript	Completed
December 10, 2024	Proposal Defense	Completed
December 12, 2024	Revision of Chapter 1 and Chapter 2 based on the proposal defense	Completed
January 17, 2025	Preparation of documents for REC review	Completed
January 24, 2025	Application for REC review	Completed
January 31, 2025	Participant Recruitment Conducting initial orientation meetings to discuss study details and consent.	Completed
February 5, 2025	Distribute and collect survey responses via Google Forms	Completed
February 6, 2025	Schedule and conduct face-to-face and virtual interviews	Completed
February 2025	Analyze institutional documents for SWOT analysis	Completed
February to March 2025	Data Cleaning and Organization - Review collected data for completeness, accuracy, and consistency Quantitative Data Analysis - Analyze survey data using descriptive and inferential statistics in SPSS Qualitative Data Analysis - Transcribe interview recordings and perform thematic analysis Integration of Data - Integrate quantitative and qualitative findings for a comprehensive analysis	Completed
March to May 2025	Consultation with Adviser - Regular consultations with the research adviser for validation of findings and recommendations Final Report Writing - Draft the research report, including methods, results, and discussions Presentation and Feedback - Present findings to the department and gather feedback	



LORMA COLLEGE OF MEDICAL LABORATORY SCIENCE
Center for Health Sciences, Carlatan, City of San Fernando, La Union, Philippines,
2500 Facebook: @LormaCMLS | E-mail: cmls@lorma.edu



	Data Disposal Securely delete all collected data following ethical guidelines	
--	---	--

Q. Plagiarism Checker

**FORENSIC SCIENCE AS AN ELECTIVE I...** Saved Goals 83 Overall score

CHAPTER I
INTRODUCTION

Background of the Study
Medical Technology (MT), also referred to as Medical Laboratory Science (MLS), is a highly specialized field in healthcare that utilizes a combination of scientific principles, laboratory techniques, and advanced technologies to perform diagnostic tests that are essential for patient care. The role of MLS professionals is crucial as their work directly impacts the diagnosis, management, treatment, and prevention of diseases. Therefore, the accuracy and reliability of the released laboratory test results are vital in medical decision-making, establishing how these professionals are an indispensable part of the healthcare system (CHED CMO No. 13, 2017).
In the Philippines, the Commission on Higher Education (CHED) defines and regulates the curriculum for MT/MLS through Memorandum Order

 B I U | H1 H2 |  |  |  1,981 words ^

 Review suggestions  Write with generative AI  Check for AI text & plagiarism

**No plagiarism or AI text detected**
Your document doesn't match anything in our references or contain common AI text patterns.
[See all suggestions](#)

Chapter I

**FORENSIC SCIENCE AS AN ELECTIVE I...** Goals 75 Overall score

CHAPTER II
RESEARCH METHODOLOGY

Research Design
A mixed-method convergent parallel approach will be used in this study. Mixed methods research combines elements of quantitative research and qualitative research in order to answer your research question (George, 2021). This method allows data to be collected simultaneously. The analysis, correlation, and comparison of quantitative and qualitative data are done concurrently. Through this approach, the primary contributing factors are identified in the quantitative phase, and the data will be supplemented by the overarching concepts in the qualitative phase.
In the context of this study, a quantitative survey will be carried out to gather information on the opinions and experiences of BS MT/MLS administrators, faculty, students, and alumni with reference to the

 B I U | H1 H2 |  |  |  1,937 words ^

 Review suggestions  Write with generative AI  Check for AI text & plagiarism

**No plagiarism or AI text detected**
Your document doesn't match anything in our references or contain common AI text patterns.
[See all suggestions](#)

Chapter II

Untitled document

Goals

92 Overall score

Review suggestions

Write with generative AI

Check for AI text & plagiarism

CHAPTER III

RESULTS AND DISCUSSION

This chapter presents the analysis and interpretation of data gathered through survey questionnaires and interviews with administrators, faculty, students, and alumni from CHED-accredited BS MT/MLS programs. It highlights their perceptions of the relevance and acceptability of integrating forensic science as an elective course and its potential to enhance MLS graduates' competencies and career opportunities.

1. What is the perceived level of relevance of forensic science in the BS MT/MLS curriculum among the following stakeholders?

1.1 Classification

Table 1. Classification

Classification	Frequency	Percentage
2,048 words		

No plagiarism or AI text detected

Your document doesn't match anything in our references or contain common AI text patterns.

See all suggestions

Chapter III

FORENSIC SCIENCE AS AN ELECTIVE I...

Goals

84 Overall score

Review suggestions

Write with generative AI

Check for AI text & plagiarism

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the findings of the current study, the following conclusions were derived:

1. The study discloses a keen perception of relevant forensic science within the BS MT/MLS curriculum among the different holders of authority: the administrators (Deans and Program Heads/Chairs) and faculty. These stakeholders agree overwhelmingly that the inclusion of forensic science topics would serve to better ground the knowledge and skills of MT/MLS graduates, render the course more comprehensive and attractive, have a footing in today's trends in the fields of healthcare and law, offer a wider variety of employment opportunities, and ultimately prepare students better for their future endeavors in their professional practice. The entire survey mean score is 3.64, interpreted here as "Greatly Agree" (strongest degree of agreement and highest level of agreement).

No plagiarism or AI text detected

Your document doesn't match anything in our references or contain common AI text patterns.

See all suggestions

Chapter IV

R. Grammar Checker

FORENSIC SCIENCE AS AN ELECTIVE I...

Saved

Goals

99 Overall score

CHAPTER I

INTRODUCTION

Background of the Study

Medical Technology (MT), also referred to as Medical Laboratory Science (MLS), is a highly specialized field in healthcare that utilizes a combination of scientific principles, laboratory techniques, and advanced technologies to perform diagnostic tests that are essential for patient care. The role of MLS professionals is crucial as their work directly impacts the diagnosis, management, treatment, and prevention of diseases. Therefore, the accuracy and reliability of the released laboratory test results are vital in medical decision-making, establishing how these professionals are an indispensable part of the healthcare system (CHED CMO No. 13, 2017).

The Commission on Higher Education (CHED) defines and regulates the

2,162 words

Review suggestions

Write with generative AI

Check for AI text & plagiarism

Look at that!

There are no more suggestions.

Check for plagiarism and AI text

Chapter I

FORENSIC SCIENCE AS AN ELECTIVE I...

Goals

99 Overall score

CHAPTER II

RESEARCH METHODOLOGY

Research Design

A mixed-method convergent parallel approach was used in this study. Mixed methods research combines elements of quantitative research and qualitative research in order to answer your research question (George, 2021). This method allows data to be collected simultaneously. The analysis, correlation, and comparison of quantitative and qualitative data are done concurrently. Through this approach, the primary contributing factors are identified in the quantitative phase, and the data were supplemented by the overarching concepts in the qualitative phase.

In the context of this study, a quantitative survey was carried out to gather information on the opinions and experiences of BS MT/MLS

1,662 words

Review suggestions

Write with generative AI

Check for AI text & plagiarism

Look at that!

There are no more suggestions.

Check for plagiarism and AI text

Chapter II

FORENSIC SCIENCE AS AN ELECTIVE I...

Goals

100 Overall score

CHAPTER III

RESULTS AND DISCUSSION

This chapter presents the analysis and interpretation of data gathered through survey questionnaires and interviews with administrators, faculty, students, and alumni from CHED-accredited BS MT/MLS programs. It highlights their perceptions of the relevance and acceptability of integrating forensic science as an elective course and its potential to enhance MLS graduates' competencies and career opportunities.

Perceived level of relevance of forensic science in the BS MT/MLS curriculum

Table 1. Relevance of Forensic science to MT/MLS

Relevance of Forensics to MT/MLS	Mean	Standard Deviation
Verbal Interpretation		
R1. Forensic science topics are related to the knowledge and skills required for the professional practice of medical technology/medical laboratory science.	3.44	0.73 Strongly Agree

3,959 words

Review suggestions

Write with generative AI

Check for AI text & plagiarism

Time to dig in.

Suggestions will appear here.

Check for plagiarism and AI text

Chapter III

FORENSIC SCIENCE AS AN ELECTIVE I...

Goals

99 Overall score

CHAPTER IV
CONCLUSIONS AND RECOMMENDATIONS

Conclusion
 Based on the findings of the current study, the following conclusions were derived:
 1. The study discloses a keen perception of relevant forensic science within the BS MT/MLS curriculum among the different holders of authority: the administrators (Deans and Program Heads/Chairs) and faculty. These stakeholders agree overwhelmingly that the inclusion of forensic science topics would serve to better ground the knowledge and skills of MT/MLS graduates, render the course more comprehensive and attractive, have a footing in today's trends in the fields of healthcare and law, offer a wider variety of employment opportunities, and ultimately prepare students better for their future endeavors in their professional practice. The entire survey mean score is 3.64, interpreted here as

Review suggestions

Write with generative AI

Check for AI text & plagiarism

Looking good!
There are no more suggestions.

Check for plagiarism and AI text

796 words

Chapter IV

S. Statistician Certificate

CERTIFICATION

This is to certify that the data analysis conducted for the research entitled:

**FORENSIC SCIENCE AS AN ELECTIVE IN MEDICAL LABORATORY SCIENCE:
A BASIS FOR CURRICULUM INTEGRATION AND INNOVATION**

have been thoroughly reviewed. The review included the accuracy of the calculations and interpretation.

This certification confirms the integrity and accuracy of the data analysis conducted in this research, ensuring that the findings are reliable and valid for academic, clinical, or practical application


Engr. LOU BENEDIC C. VALLE, M.A.-Math
Statistician
Certified Google Data Analyst
DICT-ILCDB Recognized Data Analytics Resource Person

T. Photo Documentations

Edhel Joyce Hermida is presenting

3 – Agree
2 – Disagree
1 – Strongly disagree

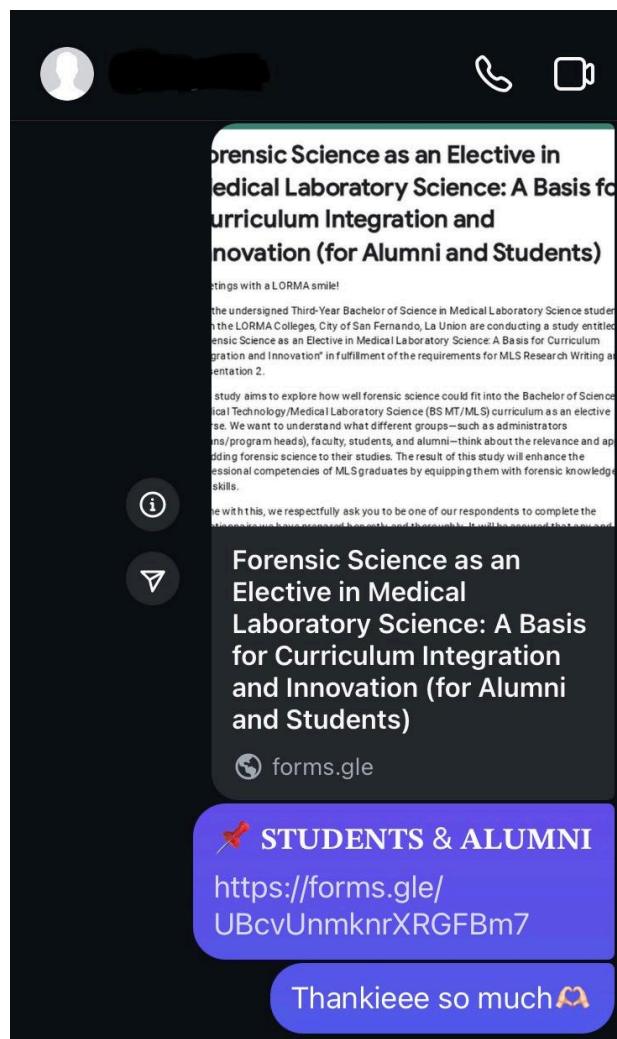
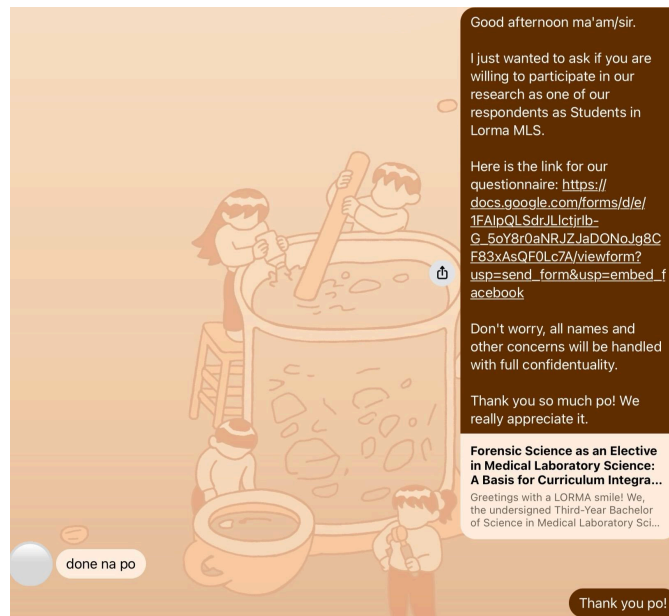
	1	2	3	4
1. Forensic science topics are related to the knowledge and skills required for the professional practice of medical technology/medical laboratory science.				
2. Incorporating forensic science would make the MT/MLS program more comprehensive and well-rounded.				
3. The integration of forensic science to the MT/MLS curriculum would enhance students' understanding of practical applications in the field.				
4. The exposure to forensic science concepts and principles would improve students' critical thinking and problem-solving skills.				
5. The inclusion of forensic science in the MT/MLS program would make the program more attractive to prospective students.				

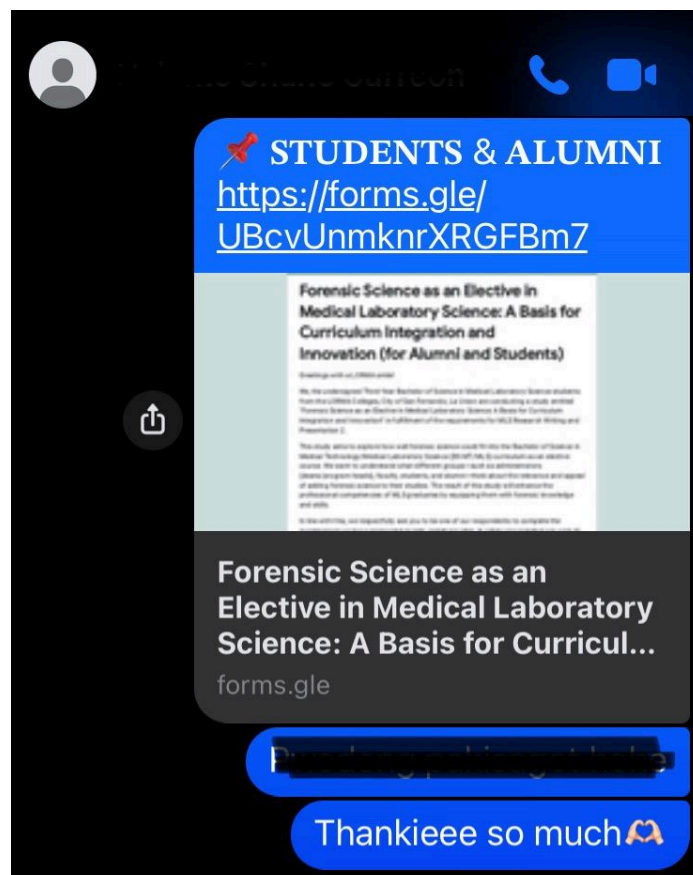
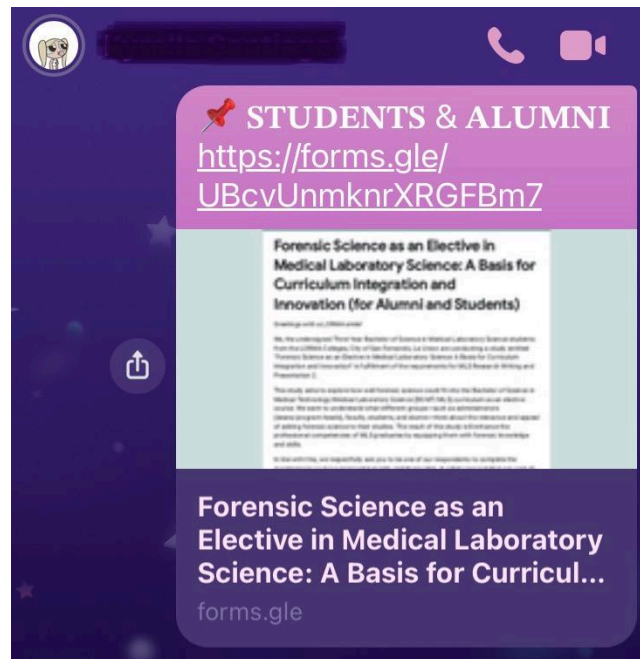
Participants: You, Edhel Joyce, Audresse Julia, Jasmin Bea, Alliah Mae, Hanz

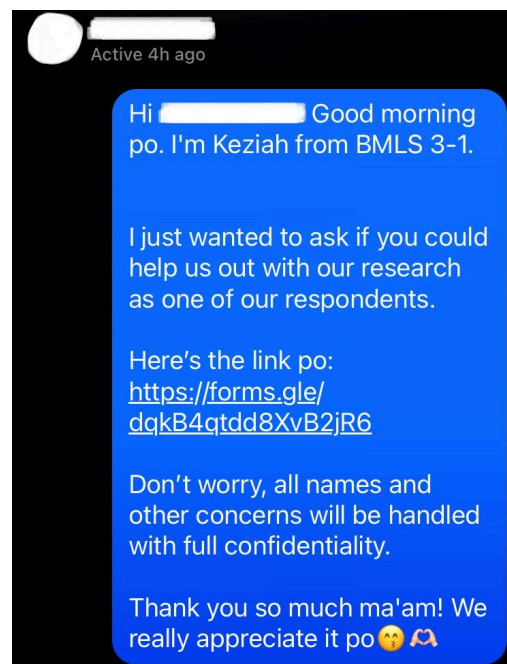
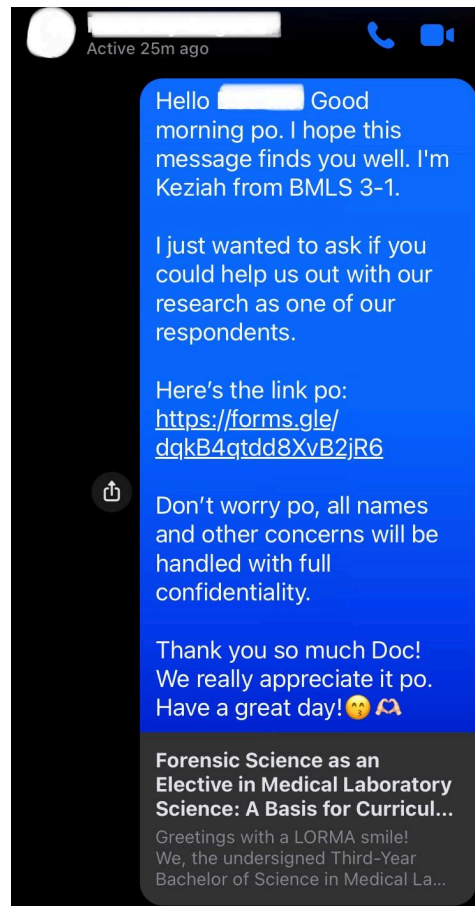
Edhel Joyce Hermida is presenting

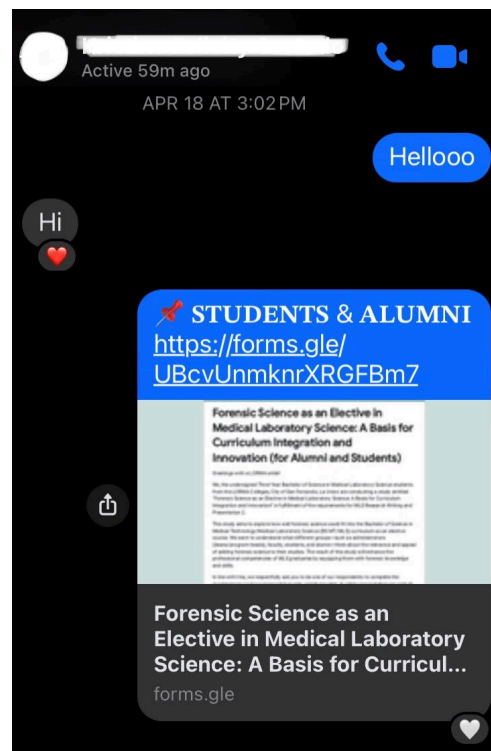
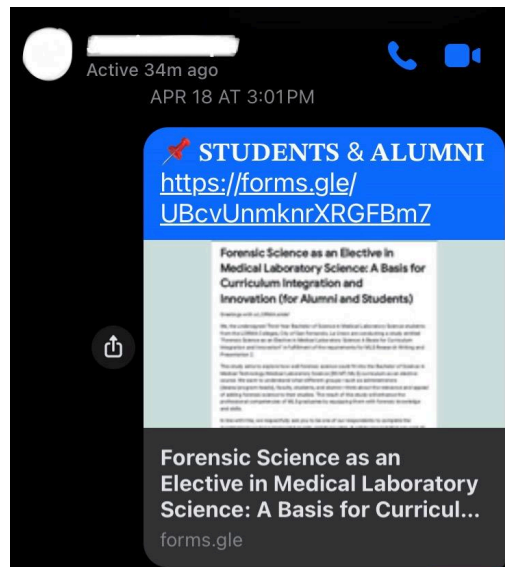
- Endorsement and approval sheet
- Research abstract
- Types of headings
- **Letter to be printed**
 - Manuscript
 - Letter of intent to the research adviser
 - Curriculum vitae
 - Application for review form
 - Informed consent form
 - Submission checklist
 - Time table
- **After defense:**
 - Compliance report to be submitted to adviser, panel members, REC & must be signed by Rcoordinator, Rinstructor, and Radviser with the old manuscript used during defense
- **Chapter 3 review and furnish**
 - Keziah
 - Edhel
 - Audresse
- **Chapter 4 review and furnish**
 - Alliah
 - Hanz
 - Bea

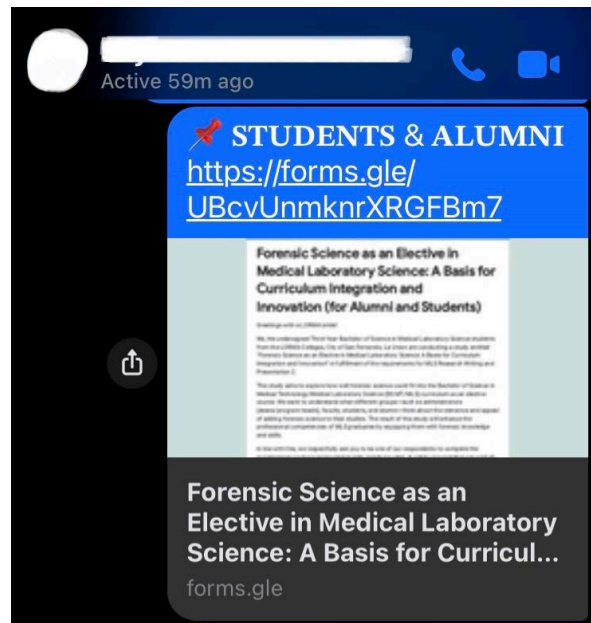
Participants: You, Edhel Joyce, Audresse Julia, Jasmin Bea, Alliah Mae, Hanz











Good afternoon ma'am.

I just wanted to ask if you are willing to participate in our research as one of our respondents as Faculty/Dean in Lorma MLS.

Here is the link for our questionnaire: <https://forms.gle/BxLHH6TTQwiWVxLH9>

Don't worry, all names and other concerns will be handled with full confidentiality.

Thank you so much po! We really appreciate it.

Forensic Science as an Elective in Medical Laboratory Science: A Basis for Curriculum Integra...

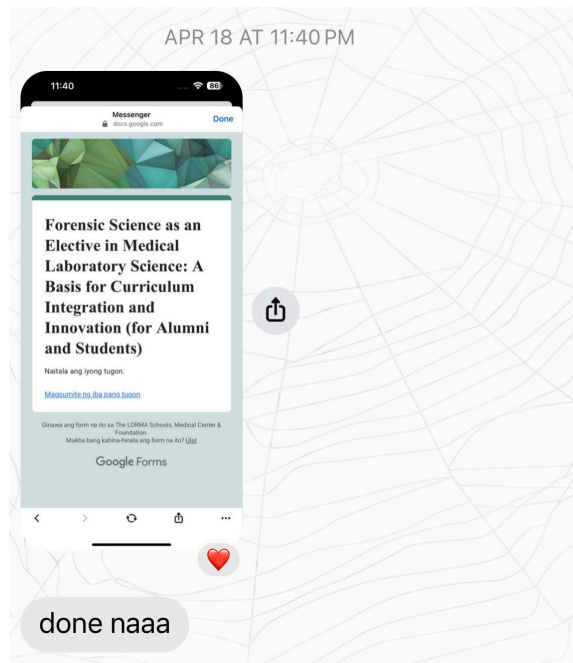
Greetings with a LORMA smile! We, the undersigned Third-Year Bachelor of Science in Medical Laboratory Sci...

You can now message and call each other and see info like active status and when you have read messages.

Sure, happy to help 🙌

Sure, happy to help 🙌

Thank you so much ma'am 🙏



You're friends on Facebook

[View profile](#)

End-to-end encrypted

Messages and calls are secured with end-to-end encryption. [Learn more](#)

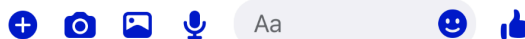
APR 20 AT 11:03 AM

Hi ate, good morning! I just want to ask po if pwede ka namin kunin as respondents for research namin? If yes, we're hoping you could help us out with our research.

Here's the link po: <https://forms.gle/31fiYRefhEhiWC1i6>

Thank you so much po! We really appreciate it.

Delivered



APR 20 AT 10:35 AM

Hi Ma'am, good morning!
I just want to ask po if you're
an MLS graduate from
Lorma? If yes, we're hoping
you could help us out with
our research as one of our
respondents.

Here's the link po: [https://
forms.gle/
31fiYRefhEhiWC1i6](https://forms.gle/31fiYRefhEhiWC1i6)

Don't worry, all names and
other concerns will be
handled with full
confidentiality.

Thank you so much po! We
really appreciate it.

**Forensic Science as an
Elective in Medical Laboratory
Science: A Basis for Curricul...**

Greetings with a LORMA smile!
We, the undersigned Third-Year
Bachelor of Science in Medical La...

Delivered

APR 20 AT 11:03 AM

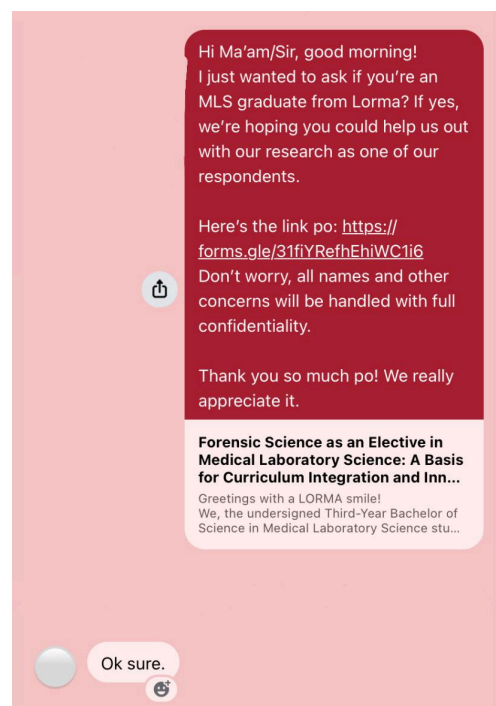
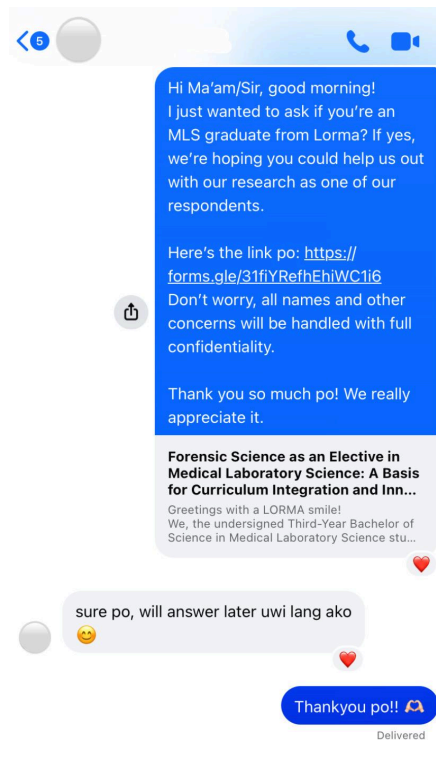
Hi ate, good morning! I just want
to ask po if pwede ka namin
kunin as respondents for
research namin? If yes, we're
hoping you could help us out
with our research.

Here's the link po: [https://
forms.gle/31fiYRefhEhiWC1i6](https://forms.gle/31fiYRefhEhiWC1i6)

Thank you so much po! We
really appreciate it.



Delivered



Edhel Joyce Hernandez is presenting

7:39 PM Fri Apr 25

docs.google.com

Alumni & Students - Google Forms

Forensic Science as an Elective in Me

Questions Responses 51 Settings

Summary Question Individual

Section 1: Position

Demographic profile

51 responses

Copy chart

Position	Percentage
Student	86.3%
Alumni/Graduate	13.7%

Section 2: Relevance of Forensics to MT/MLS

1. I am amenable for taking additional courses related to forensic science

Copy chart

You Edhel Joyce Audresse Julia Jasmin Bea Alliah Mae

Edhel Joyce Hernandez is presenting

7:39 PM Fri Apr 25

docs.google.com

Alumni & Students - Google Forms

Dean & Faculty - Google Forms

Forensic Science as an Elective in Me

Questions Responses 16 Settings

Summary Question Individual

Section 1: Position

Demographic profile

16 responses

Link to Sheets

Copy chart

Position	Percentage
Dean/Program Head	68.8%
Faculty	12.5%
Clinical/Industry Professional	18.8%

Section 2: Relevance of Forensics to MT/MLS

1. I am amenable for taking additional courses related to forensic science

You Edhel Joyce Audresse Julia Jasmin Bea Alliah Mae

Author(s) Biodata

Alliah Mae C. Balala is currently taking her Bachelor of Science in Medical Laboratory Science at LORMA Colleges. As a driven student-researcher, she aims to contribute to curriculum development. Her recent research advocates for integrating forensic science into the MLS program to promote versatility and real-world application.

Hanz Klyne R. Buenavista, a third-year Bachelor of Medical Laboratory Science student at LORMA College, is passionate about science, health, and research. Dedicated to academic excellence and service, he strives to enhance his skills and knowledge to make a meaningful impact in the medical laboratory field and healthcare industry.

Ma. Keziah R. Fabiculanan is a dedicated BS in Medical Laboratory Science student at LORMA Colleges. She values hard work, growth, and academic excellence. Passionate about healthcare and diagnostics, she strives to gain the skills and experience needed to make a meaningful impact in the medical field and enhance patient care.

Audresse Julia C. Galvan is pursuing a BS in Medical Laboratory Science at LORMA Colleges. Passionate about healthcare, she is dedicated to patient care through accurate, and ethical laboratory practices. Aspiring to be a competent, dependable medical professional who upholds excellence, integrity, and compassion, with a commitment to lifelong learning.

Edhel Joyce C. Hermida is a BS Medical Laboratory Science student at LORMA Colleges. Driven by curiosity and purpose, she strives to make a difference in healthcare through compassion, learning, and service. She believes in the power of perseverance, education, and faith to transform lives and uplift communities.

Jasmin Bea V. Mendoza is an aspiring medical laboratory scientist whose academic journey is marked by determination, adaptability, and a relentless pursuit of excellence. Bea's journey reflects her resolve to inspire others facing similar challenges in education, demonstrating that persistence and passion can overcome any obstacle.