



HELEN GRACE B. GONZALES

Assistant Professor III

College of Technology

University of Science and Technology of Southern Philippines (USTP)

Cagayan de Oro City, Philippines



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I. PROFESSIONAL PROFILE

Dr. Helen Grace B. Gonzales is an Assistant Professor in the College of Technology at the University of Science and Technology of Southern Philippines (USTP). She holds a Doctorate in Technology Education and has a strong academic and professional foundation in **Electronics Engineering, Robotics, Artificial Intelligence, and Engineering Education**.

Her work integrates **applied engineering, intelligent systems, and pedagogy**, with a particular focus on **robotics education, embedded systems, computer vision, and simulation-based learning**. She is actively involved in instruction, research, extension, and mentorship, contributing to institutional goals in innovation, sustainability, and community engagement.

II. AREAS OF EXPERTISE AND INTEREST

- Robotics Education and Intelligent Systems
- Artificial Intelligence and Machine Learning Applications
- Embedded Systems and Internet of Things (Arduino, ESP32, PLC)
- Computer Vision and Object Detection
- **Robotics Simulation and Virtual Environments (Webots, Gazebo)**
- Engineering and Technology Education
- Sustainability, Technopreneurship, and Extension Innovation

III. EDUCATIONAL ATTAINMENT

Doctor of Technology Education (DTE)

University of Science and Technology of Southern Philippines

August 2025

Master of Science in Electrical Engineering

Specialization: Robotics Control

Southern Taiwan University of Science and Technology

June 2021

Bachelor of Science in Electronics and Communications Engineering

MSU-Iligan Institute of Technology

April 2013

IV. PROFESSIONAL AND ACADEMIC EXPERIENCE

Assistant Professor III

Department of Electromechanical Technology

College of Technology, USTP

March 2017 - Present

Teaching Functions

- Teaches courses in **Computer Programming, Electronics, Robotics, Industrial Management, Interfacing, Quality Assurance, Technopreneurship, and Business Continuity Mapping**
- Develops **outcome-based instructional materials, laboratory manuals, and simulation-supported learning activities**
- Integrates **robotics simulation tools (Webots and Gazebo)** to enhance conceptual understanding and safe system testing prior to hardware deployment

Research Functions

- Conducts research in **robotics, artificial intelligence, embedded systems, and engineering education**
- Supervises undergraduate and senior high school research projects
- Serves as research mentor, panelist, and evaluator in institutional and external research activities

Extension and Service

- Participates in community-based technology and sustainability projects
- Leads and supports training programs related to robotics, automation, and innovation
- Contributes to institutional committees and academic services

Web Admin Assistant

Wynquest Technical Solutions, Canada

January 2014 - February 2017

- Developed and maintained corporate websites
- Managed **SEO and social media strategies**
- Provided technical support in web administration and digital content management

V. RESEARCH AND SCHOLARLY PUBLICATIONS

Peer-Reviewed Journal Articles (Selected)

1. Gonzales, H. G. (2023). *Revolutionizing appliance automation: ESP32 and Blynk*. **Science International**, 35(3), 257–261.
2. Gonzales, H. G. B. (2023). *The influence of lean principles on waste management and sustainability efforts*. **Cognizance Journal of Multidisciplinary Studies**, 3(4), 19–24.
3. Gonzales, H. G. B. (2024). *INA: Intelligent nursing assistant robot for quarantine management utilizing Haar Cascade algorithm and Cagebot materials*. **Proceedings on Engineering Sciences**, 6(2), 885–896.

4. Gonzales, H. G. B., Parambita, J. C., Emar, K. J. U., et al. (2025). *Enhancing object detection with FOMO for real-time bus and seat availability*. **Mindanao Journal of Science and Technology**, 23(2), 193–225.

5. Suparmi, A., Paidi, P., & Gonzales, H. G. B. (2025). *Problem-based learning materials using mangrove forest potential*. **Jurnal Kependidikan**, 9(2), 109–117.

6. Gonzales, H. G. B. (2025). *Training needs assessment for mentorship in the National Robotics Competition*. **Cognizance Journal of Multidisciplinary Studies**, 5(9), 41–47.

7. Gonzales, H. G. B. (2025). *Mentoring insights from panel assessments of high school research proposals in robotics*.

8. Simanjuntak, H. T. A., et al. (2024). *Benchmark study of protein embeddings*. **Elinvo**, 9(2), 238–252.

9. Gonzales, H. G. B. (2023). *Entrepreneurial mindset among senior high school students in Region 10*. **Science International**, 35(3), 305–308.

10. Gonzales, H. G. B. (2023). *Performance evaluation of an Arduino-controlled wood scaling machine*. **Cognizance Journal of Multidisciplinary Studies**, 3(4), 25–31.

VI. TEACHING INNOVATIONS AND PEDAGOGICAL PRACTICES

- Incorporation of **simulation-based robotics and automation instruction** using **Webots and Gazebo** to allow students to model, test, and validate robotic behaviors prior to physical deployment
- Use of **virtual electronics and circuit design platforms** such as **Tinkercad** and **Cirkit.io** to support foundational learning in electronics, microcontrollers, and system integration, particularly in resource-constrained learning environments
- Integration of **block-based and text-based programming environments**, including **Scratch and Arduino**, to scaffold student learning from introductory computational thinking to embedded systems and robotics applications
- Strong emphasis on **problem-based and project-based learning**, where students design, simulate, build, and evaluate functional prototypes aligned with real-world engineering challenges
- Alignment of laboratory activities with **industry-relevant engineering practices**, emphasizing hands-on experimentation, debugging, documentation, and system testing
- **Mentorship-driven research supervision**, guiding students in research design, prototyping, data collection, and technical reporting for academic and competition-based outputs

VII. TECHNICAL SKILLS AND COMPETENCIES

Robotics and Automation

- Robotics system design, modeling, and control
- Embedded systems (Arduino, ESP32, PLC)
- **Robotics simulation using Webots and Gazebo**
- Sensor integration, actuator control, and autonomous systems

Programming and Software

- C, C++, Python, Java, PHP, HTML, CSS, JavaScript, SQL
- MATLAB, Scilab, Xilinx, Multisim, Synopsys
- Visual Basic, Proteus, ISIS, Circuit Wizard

Hardware and Instrumentation

- Electrical testing and measurement (oscilloscopes, multimeters)
- Computer hardware assembly and troubleshooting

Design and Digital Tools

- Adobe Photoshop, CorelDRAW
- Video editing and instructional media development

VIII. EXTENSION, MENTORSHIP, AND COMMUNITY ENGAGEMENT

BASIC EDUCATION & GOVERNMENT PARTNERS

- **Department of Education Region X (DepEd Region 10)**
 - Robotics education support
 - Teacher training and student mentoring
- **DepEd El Salvador City Division**
 - Senior High School research mentoring
 - Robotics and technology extension activities
- Partner Public Secondary Schools:
 - **Cagayan de Oro National High School (CDONHS)**
 - **Gusa Regional Science High School**

FLAGSHIP EXTENSION & ROBOTICS PROGRAMS

- **RoboLikha: Creative Robotics and Technologies for Inclusive STEM Learning**
 - Multi-year extension initiative (teacher bootcamps, student mentoring, competitions, LikhaTech Corners)
 - Alignment with USTP CARES and UN SDGs
- **RoboKids / Weekend Robotics Camps**
 - Introductory robotics and programming for basic education learners
- **National Robotics Competition (NRC)-related Mentorship & Assessment**
 - Training Needs Assessment
 - Research proposal mentoring and panel evaluation

INTERNATIONAL ACADEMIC EXTENSION & COLLABORATIONS

- **Universitas Negeri Yogyakarta (Indonesia)**
 - Robotics education and technology training collaboration
- **Southern Taiwan University of Science and Technology (Taiwan)**
 - Robotics control, graduate training, and academic collaboration
- **Kun Shan University (Taiwan)**
 - Engineering and technology cooperation
- **Shayangye Cagebot (Taiwan)**
 - Educational robotics platforms and materials support
- **Conservatoire national des arts et métiers (CNAM, France)**
 - Internship and applied engineering exposure
 - Materials engineering and fabrication collaboration

INTERNATIONAL & NATIONAL INDUSTRY/INSTITUTIONAL PARTNERS

- **Dattakala Group of Institutions (India)**
 - Faculty Development Programs (e-FDP)
 - Robotics, automation, and mechatronics training
 - Ongoing MOU/MOA discussions
- **Yuanhao Optoelectronics Co., Ltd.**
 - Industry-academe collaboration
 - LED driver circuits, automotive lighting, and R&D exposure

COMMUNITY & AGRI-INDUSTRIAL EXTENSION PARTNERS

- **Misamis Oriental Integrated Farmers Cooperative (MINFARCCO)**
 - Machine design and development projects
 - Agro-industrial technology support
- **Local farmer groups and MSMEs in Misamis Oriental**
 - Coconut sap processing
 - Bamboo skewer polishing machine development
 - Sustainable fabrication and mechanization projects

EXTENSION MODALITIES YOU CONSISTENTLY PROVIDE

- Robotics and AI training workshops
- Teacher and student research mentoring
- Technology needs assessment and prototyping
- Simulation-supported and fabrication-assisted extension delivery
- Panel assessment and evaluation services

IX. PROFESSIONAL QUALITIES

- Strong leadership and organizational skills
- Meticulous attention to detail
- Effective communication and teamwork
- Commitment to ethical research and quality instruction

X. PROFESSIONAL AFFILIATIONS & INTERESTS

Interests: Robotics, Academic Research, Technology Innovation, Hiking, Singing, Travel