



ASEAN

Electrical Engineering

Information Exchange

2024

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by

Institute of Integrated Electrical Engineers of the Philippines, Incorporated (IIEE)

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FOREWORD

The electrical engineering profession is at the forefront of ASEAN's infrastructure and technological advancements, playing a crucial role in economic development across the region. In recognition of this, the **ASEAN Electrical Engineering Information Exchange Template** has been created as a comprehensive platform to promote collaboration, professional mobility, and harmonized standards among ASEAN member states. This template serves as a valuable tool for sharing essential information on education, licensure, safety standards, and regulatory compliance, ensuring consistency and professional growth across borders.

This initiative would not have been possible without the collective efforts of **subject matter experts, academe professors and researchers, LGU government regulators, industry and manufacturing experts, the PRC Engineering Cluster oversight Commissioner Erwin M. Enad, and the dedicated staff of the Institute of Integrated Electrical Engineers (IIEE)**. Their expertise and commitment have been integral to the development of this template, ensuring that it addresses the specific needs and challenges of the electrical engineering profession in the ASEAN context.

As ASEAN continues to integrate economically, the need for a common framework that supports mutual recognition, and collaboration is more vital than ever. This template not only aligns standards and practices but also fosters innovation and best practices across the region, enabling electrical engineers to meet the growing demands of energy, infrastructure, and technological progress.

With gratitude to all contributors, we look forward to the continued growth and success of this initiative, benefiting engineers, industries, and economies alike.

FRANCIS V. MAPILE

Chairman

Professional Regulatory Board of Electrical Engineering

Professional Regulation Commission

Philippines

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The preparation of this annual was made possible through the efforts of the dedicated professionals who have contributed to it, sharing their knowledge, experience, and expertise.

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INTRODUCTION

The electrical engineering profession plays a critical role in the development and progress of ASEAN economies. With increasing interconnectivity and cross-border collaboration, it is vital to establish a framework that fosters mutual understanding, cooperation, and alignment across member states. The **ASEAN Electrical Engineering Information Exchange Template** has been developed to provide a robust platform for sharing key information, promoting harmonized standards, and enabling the professional mobility of electrical engineers within ASEAN.

This template is particularly timely as the demand for skilled professionals in energy, infrastructure, and technology continues to rise. By establishing clear guidelines for education, licensure, safety standards, and regulatory compliance, this template aims to ensure that ASEAN engineers are equipped to meet the challenges of a rapidly evolving industry while maintaining the highest standards of professionalism and ethical conduct.

The ASEAN Electrical Engineering Information Exchange Template provides a comprehensive framework for collaboration, knowledge sharing, and standardization within the region. It starts with the systematic collection of data from relevant authorities and organizations across ASEAN member states. The template allows for customization to suit specific national and regional contexts, ensuring both relevance and adaptability. Periodic updates are necessary to keep the template aligned with evolving laws, standards, and best practices. Upon completion, the template will be disseminated to key stakeholders, including educational institutions, licensing bodies, engineering firms, and professional associations. Additionally, it promotes inter-country collaboration through joint initiatives and exchange programs, strengthening professional relationships across ASEAN. Ongoing user feedback will be gathered to refine and improve the template, ensuring it remains a practical tool that supports professional mobility, cross-border collaboration, compliance with Mutual Recognition Agreements (MRA), and the harmonization of regional standards.

EXECUTIVE SUMMARY

The ASEAN Electrical Engineering Information Exchange Template provides a comprehensive and structured framework aimed at facilitating professional mobility and collaboration among electrical engineers across ASEAN member states. Focusing on the Philippines as a detailed example, this template addresses key aspects such as education, licensure, regulatory laws, safety standards, and emerging technologies. By fostering consistency and uniformity, this template is designed to support the harmonization of practices and standards, enabling the seamless exchange of information and qualifications across ASEAN countries. The goal is to promote the professional development of electrical engineers while ensuring compliance with legal, ethical, and environmental standards.

Similarly, as a whitepaper, it consolidates the essential elements of the exchange template, offering detailed instructions on its use, along with sections dedicated to regulatory frameworks, technical standards, and professional networking. It serves as a vital resource for educational institutions, regulatory bodies, engineering firms, and government agencies to ensure the continuous enhancement of the electrical engineering profession across the region.

SECTION

1

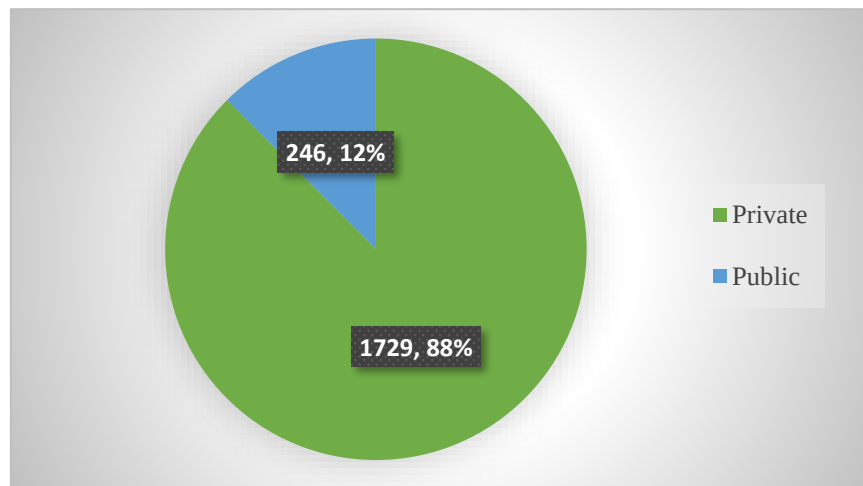
**EDUCATIONAL
INSTITUTION
IN THE
PHILIPPINES**

SECTION 1: EDUCATIONAL INSTITUTION IN THE PHILIPPINES

1.1 A. LIST OF RECOGNIZED UNIVERSITIES AND COLLEGES OFFERING ELECTRICAL ENGINEERING PROGRAMS

Higher education in the Philippines is offered through various degree programs by colleges and universities also known as higher education institutions (HEIs). These HEIs are administered and regulated by the Commission on Higher Education (CHED). As of 2020, there are over 1,975 higher education institutions (HEIs) in the country (excluding satellite campuses of state universities and colleges), classified into public and private institutions. There are 246 public higher education institutions which account for 12% of all HEIs; private institutions number 1,729, accounting for 88% of all HEIs.

Public vs Private Higher Education Institutions (as of 2020)



CLASSIFICATION ACCORDING TO WHETHER ITS ORGANIZE AS A UNIVERSITY OR AS A COLLEGE:

1. **College** is a tertiary institution that typically offers a number of specialized courses in the sciences, liberal arts, or in specific professional areas, e.g. nursing, hotel and restaurant management and information technology.
2. **University** such as state universities and colleges (SUCs), CHED-supervised higher education institutions (CHEIs), private higher education institutions (PHEIs) and community colleges (CCs)—it must meet the following requirements:
 - operate at least eight different degree programs; including
 - at least six undergraduate courses, specifically,
 - a four-year course in liberal arts,
 - a four-year course in science and mathematics,
 - a four-year course in the social sciences, and
 - a minimum of three other active and recognized professional courses leading to government licensures; and
 - at least two graduate-level courses leading to doctoral degrees.

CLASSIFICATION ACCORDING TO TYPES:

1. Whether public or private
2. Whether sectarian or nonsectarian. Sectarian HEIs are non-profit institutions owned and operated by religious organizations. Non-sectarian institutions are owned and operated by private entities that have no affiliation with religious organizations.

CLASSIFICATION ACCORDING TO GROUPS:

Higher Education Institutions (HEIs) in the Philippines are grouped differently as compared to other countries. HEIs are grouped as follows:

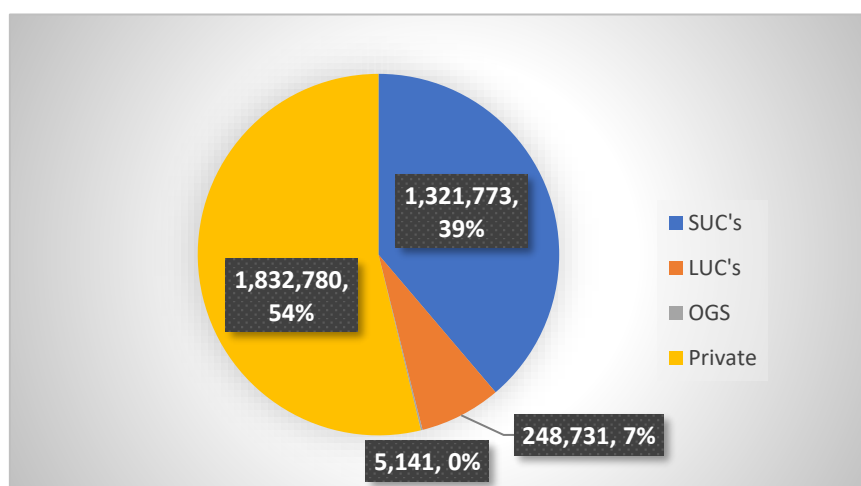
1. **National University.** The University of the Philippines is the country's national university by virtue of RA 9500 also known as The University of the Philippines Charter of 2008. Established in 1908, this premier institute of higher learning is now a university system composed of eight constituent universities located in 17 campuses all over the archipelago.
2. **Private Higher Education Institutions.** Private higher education institutions in the Philippines are further classified into sectarian and non-sectarian. Sectarian private institutions are usually non-stock, non-profit, duly incorporated, owned and operated by a religious organization.
3. **State Higher Education Institutions.** Public Higher Education Institutions are all non-sectarian entities and are further classified into two types: State university and college (SUC) or Local college and university (LCU).
 - a. State universities and colleges (SUCs) refers to any public institution of higher learning that was created by an Act passed by the Congress of the Philippines. These institutions are fully subsidized by the national government and may be considered as a corporate body. SUCs are fully funded by the national government as determined by the Philippine Congress.
 - b. Local colleges and universities (LCUs) are run by local government units.
 - c. Other Government Schools (OGS) and Special Government Schools

ENROLLMENT RATE:

Only 10 percent of college students were in state-run schools in 1980, but this rose to 21 percent in 1994 and to almost 40 percent in 2008.

For school year 2019-2020 of the 3,408,425 enrollments, 1,321,773 (38.78%) were from State Colleges and Universities (SUCs), 248,731 (7.3%) were from Local Universities and Colleges (LUCs), 5,141 (0.15%) were classified under "Other Government Schools" (OGS), while 1,832,780 (53.77%) were from Private Higher Education Institutions.

Enrollment Distribution



LIST OF UNIVERSITIES AND COLLEGES OFFERING ELECTRICAL ENGINEERING:

There are 159 HEIs offering degree/diploma programs in Electrical Engineering all over the Philippines. Some HEIs also offered graduate programs in Electrical Engineering.

Public vs Private HEI offering EE.

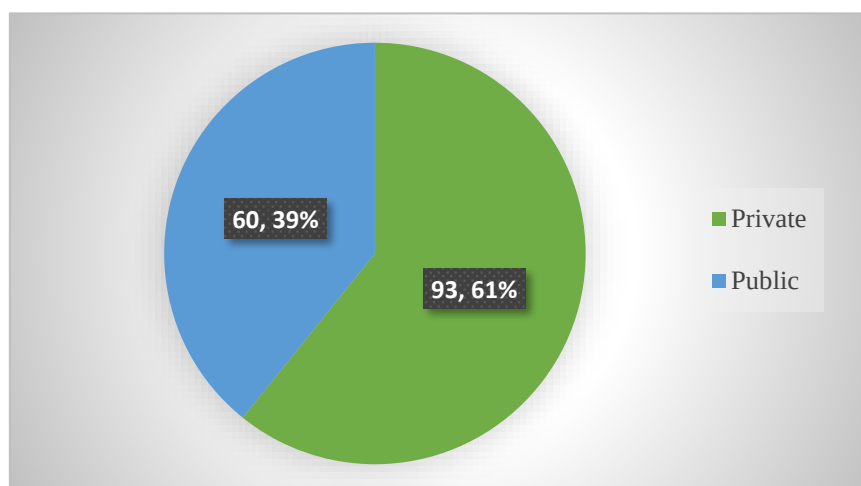


Table 1. List of Private, and Local Universities and Colleges Offering Electrical Engineering in the Philippines

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
1.	Abra State Institute of Science and Technology - Bangued Campus (Public)	Email: jjrtrinidad@asist.edu.ph Tel. No: 0917-770-8932 Website: https://asist.edu.ph/index.php/instruction/bangued-campus
2.	Adamson University (Private)	Email: webmaster@adamson.edu.ph Tel No: 8524-20-11 Website: https://www.adamson.edu.ph/v1/

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
3.	Aldersgate College (Private)	Email: info@aldersgate.edu.ph Tel. No: 0926 207 864 Website: aldersgate.edu.ph
4.	Alejandro Colleges (Private)	Email: melaniocastillo53@yahoo.com Tel. No: 0920-6199397 Website: https://www.facebook.com/ALEJANDRO-Colleges-282583508888/
5.	AMA Computer University - Davao Campus (Private)	Email: ama_davao@amaes.edu.ph Tel. No: 082-2215193 Website: http://amacollege.amaes.edu.ph/
6.	AMA Computer University - Dumaguete Campus (Private)	Email: ama_dumaguete@amaes.edu.ph Tel. No: 0955 106 6391 Website: http://amacollege.amaes.edu.ph/
7.	Andres Bonifacio College (Private)	Email: helpdesk@abcollege.edu.ph Tel. No: (065) 917 5293 Website: https://abcollege.edu.ph/
8.	Ateneo de Davao University (Private)	Email: contactus@addu.edu.ph Tel. No: (82) 221.2411 Website: https://www.addu.edu.ph/
9.	Baliuag University (Private)	Email: info@baliuagu.edu.ph Tel. No: (044) 766 2045 Website: https://baliuagu.edu.ph/
10.	Bataan Heroes Memorial College (Private)	Email: bhmcphil@yahoo.com.ph Tel. No: (047) 237 2383 Website: heroes1979.edu.ph
11.	Bataan Peninsula State University - Main Campus (State and Local)	Email: mishelpdesk@bpsu.edu.ph Tel. No: (047) 237 9214 Website: https://www.bpsu.edu.ph/
12.	Batangas State University - Alangilan Campus (State and Local)	Email: publicrelations@g.batstate-u.edu.ph Tel. No: 425-0139 Website: https://batstateu.edu.ph/campuses/alangilan/
13.	Bicol State College of Applied Sciences and Technology (State and Local)	Email: ceng@biscast.edu.ph Tel. No: (054) 472 0416 Website: https://www.biscast.edu.ph/Spartans/Colleges/College%20of%20Engineering.html
14.	Bicol University - Main Campus (State and Local)	Email: op@bicol-u.edu.ph Tel. No: +63 52 480 0167 Website: https://bicol-u.edu.ph/
15.	Biliran Province State University (State and Local)	Email: op@bipsu.edu.ph Tel. No: (053) 507-0014 Website: https://bipsu.edu.ph/
16.	BIT International College - Tagbilaran Campus (Private)	Email: biticschools@gmail.com Tel. No: 038 501 8640 Website: https://bit-icschools.com/
17.	Bohol Island State University - Main Campus (State and Local)	Email: makathleendureen.travero@bisu.edu.ph Tel. No: (038) 412 3289 Website: https://bisu.edu.ph/

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
18.	Bulacan State University - Main Campus (State and Local)	Email: officeofthepresident@bulsu.edu.ph Tel. No: (044) 919-7800 Website: https://www.bulsu.edu.ph/
19.	Cagayan de Oro College-PHINMA Education Network (Private)	Email: info.coc@phinmaed.com Tel. No: +63 916-131-8980 Website: https://coc.phinma.edu.ph/
20.	Cagayan State University - Carig Campus (State and Local)	Email: support@csucarig.edu.ph Tel. No: (078) 395-2782 Website: https://csucarig.edu.ph/
21.	Cagayan Valley Computer and Information Technology College, Inc. (Private)	Email: cvcitc@gmail.com Tel. No: (078) 503 0139 Website: https://cvcitc.edu.ph/
22.	Camarines Norte State College - Main Campus (State and Local)	Email: president@cnscc.edu.ph Tel. No: (054) 440 1199 Website: https://cnscc.edu.ph/
23.	Camarines Sur Polytechnic Colleges (State and Local)	Email: mail@cspc.edu.ph Tel. No: (054) 288 4425 Website: https://cspc.edu.ph/
24.	Capiz State University (State and Local)	Email: admin@capsu.edu.ph Tel. No: (036) 651 5347 Website: https://www.capsu.edu.ph/
25.	Caraga State University - Cabadbaran Campus (State and Local)	Email: chancellorsoffice@csucc.edu.ph Tel. No: (085) 818-5583 Website: https://www.csucc.edu.ph/
26.	Cavite State University - Indang Campus (State and Local)	Email: office.president@cvsu.edu.ph Tel. No: (046) 840-6937 Website: https://cvsu.edu.ph/
27.	Cavite State University - Rosario Campus (State and Local)	Email: cvsurosario@cvsu.edu.ph Tel. No: (046) 437-6659 Website: https://cvsu.edu.ph/
28.	Cebu Institute of Technology University (Private)	Email: cea@cit.edu Tel. No: (032) 261 7741 Website: https://cit.edu/
29.	Cebu Technological University (State and Local)	Email: information@ctu.edu.ph Tel. No: 402-4060 Website: https://www.ctu.edu.ph/
30.	Cebu Technological University - Danao Campus (State and Local)	Email: rosemary.almacen@ctu.edu.ph Tel. No: (032) 354-3660 loc 102 Website: https://www.ctu.edu.ph/danao/
31.	Central Colleges of the Philippines (Private)	Email: csec@ccp.edu.ph Tel. No: (02) 8715 5170 Website: https://www.ccp.edu.ph/
32.	Central Mindanao University (State and Local)	Email: prio@cmu.edu.ph Tel. No: (88) 356 1910 Website: https://www.cmu.edu.ph/
33.	Central Philippine University (Private)	Email: infocenter@cpu.edu.ph Tel. No: (33) 329 1971 Website: https://cpu.edu.ph/
34.	Central Philippines State University - Main Campus (State and Local)	Email: cpsu_main@cpsu.edu.ph Tel. No: 0917 301 5565 Website: https://cpsu.edu.ph/

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
35.	Colegio de Dagupan (Private)	Email: info@cdd.edu.ph Tel. No: 075-5222405 Website: https://cdd.edu.ph
36.	Colegio de San Antonio de Padua (Private)	Email: None Available Tel. No: (032) 344 4709 Website: https://www.facebook.com/CSAPDanaoCity/
37.	Colegio de San Gabriel Arcangel (Private)	Email: support@cdsga.edu.ph Tel. No: (044) 760 0397 Website: http://www.cdsga.edu.ph
38.	Colegio de San Juan de Letran (Private)	Email: ceit@letran.edu.ph Tel. No: 8527-76-93 to 97 Website: https://www.letran.edu.ph/
39.	Colegio de San Juan de Letran Calamba (Private)	Email: se@letran-calamba.edu.ph Tel. No: (049) 545 - 5453 Website: https://www.letran-calamba.edu.ph/
40.	Colegio dela Purisima Concepcion (Private)	Email: sgs@purisima.edu.ph.com Tel. No: (036) 6214 192 Website: https://www.purisima.edu.ph/
41.	Columban College (Private)	Email: info@columban.edu.ph Tel. No: (047) 222 3329 Website: https://columban.edu.ph/
42.	Cristal e-College - Panglao Campus (Private)	Email: registrar@cec.edu.ph Tel. No: 038 502 8408 Website: https://cec.edu.ph/
43.	De La Salle Lipa (Private)	Email: helpdesk@dls.edu.ph Tel. No: 043 302 2900 Website: https://www.dls.edu.ph/
44.	De La Salle University Dasmariñas (Private)	Email: ceatsecretary@dlsud.edu.ph Tel. No: (46) 481.1900 Website: https://www.dlsud.edu.ph/
45.	Divine Word College of Laoag (Private)	Email: dwcladmin@dwcl.edu.ph Tel. No: (077) 771 6380 Website: https://www.facebook.com/DWCLlaoagcityin/
46.	Divine Word College of Legazpi (Private)	Email: dwlinfo@dwc-legazpi.edu Tel. No: 52 742 7966 Website: https://www.dwc-legazpi.edu/
47.	Don Honorio Ventura State University (State and Local)	Email: info@dhvsu.edu.ph Tel. No: (045) 649 8050 Website: https://dhvsu.edu.ph/
48.	Don Mariano Marcos Memorial State University - Mid La Union Campus (State and Local)	Email: www.dmmmsu.edu.ph Tel. No: (072)-700-5453 Website: www.dmmmsu.edu.ph
49.	Dr. Yanga's College, Inc. (Private)	Email: dycifrontline@gmail.com Tel. No: (044) 617-3419 Website: https://dyci.edu.ph/
50.	Eastern Samar State University (State and Local)	Email: info@essu.edu.ph Tel. No: 0916 185 5375 Website: https://www.essu.edu.ph/

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
51.	Eastern Visayas State University Tacloban (State and Local)	Email: president@evsu.edu.ph Tel. No: (053) 321 1084 Website: https://www.evsu.edu.ph/
52.	Emilio Aguinaldo College - Cavite Campus (Private)	Email: @eac.edu.ph Tel. No: +63 46 416-4341 to 42 Website: https://www.eac.edu.ph/cavite/
53.	Eulogio Amang Rodriguez Institute of Science and Technology (State and Local)	Email: earistofficial1945@gmail.com Tel. No: (02) 7738 5059 Website: https://earist.edu.ph/
54.	Far Eastern University Institute of Technology (Private)	Email: eee@feutech.edu.ph Tel. No: (02) 8281 8888 Website: https://www.feutech.edu.ph/
55.	Foundation University (Private)	Email: info@foundationu.com Tel. No: (035) 422 9167 Website: https://www.foundationu.com/
56.	Garcia College of Technology (Private)	Email: gct.kalibo@gmail.com Tel. No: (036) 268-6209 Website: https://www.gct.edu.ph/
57.	Golden Gate College (Private)	Email: goldengatecolleges@gmail.com Tel. No: (043) 723 2663 Website: https://goldengatecolleges.net/main/index.php
58.	Golden Success College (Private)	Email: goldensuccess_college@yahoo.com Tel. No: (032) 263-2652 Website: https://golden-success.com/
59.	Holy Angel University (Private)	Email: ceadean@hau.edu.ph Tel. No: (63) 045-625-5748 Website: https://www.hau.edu.ph/
60.	Jose Rizal Memorial State University (State and Local)	Email: university.president@jrmsu.edu.ph Tel. No: (0919) 003 8434 Website: http://jrmsu.edu.ph/
61.	La Salle University Ozamiz (Private)	Email: president@lsu.edu.ph Tel. No: (0985) 346 0730 Website: https://www.lsu.edu.ph/
62.	Laguna State Polytechnic University (State and Local)	Email: info@lspu.edu.ph Tel. No: 304-7000 Website: https://lspu.edu.ph/campus/home/scc
63.	Laguna State Polytechnic University - San Pablo Campus (State and Local)	Email: cd_spc@lspu.edu.ph Tel. No: (049)554-9910 Website: https://lspu.edu.ph/campus/home/spc
64.	Liceo de Cagayan University (Private)	Email: inquiries@liceo.edu.ph Tel. No: 088 858-4093 Website: https://www.liceo.edu.ph/
65.	Lyceum Northwestern University (Private)	Email: enair@lyceum.edu.ph Tel. No: (075) 656-3247 Website: https://lyceum.edu.ph/
66.	Lyceum of Subic Bay (Private)	Email: info@lsb.edu.ph Tel. No: (047) 252 5940

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
		Website: https://www.lsb.edu.ph/
67.	Lyceum of the Philippines University - Cavite Campus (Private)	Email: cvt@lpu.edu.ph Tel. No: (046) 481-1444 Website: https://cavite.lpu.edu.ph/
68.	Malayan Colleges Laguna (Private)	Email: support@mcl.edu.ph Tel. No: (049) 832 4000 Website: https://mcl.edu.ph/
69.	Malayan Colleges Mindanao (Private)	Email: support@mcm.edu.ph Tel. No: 0918 918 1626 Website: https://mcm.edu.ph/
70.	Manuel L. Quezon University (Private)	Email: registrar@mlqu.edu.ph Tel. No: 0966 358 4857 Website: https://www.mlqu.ph/
71.	Manuel S. Enverga University Foundation (Private)	Email: ceng@mseuf.edu.ph Tel. No: 710-3151 Website: https://mseuf.edu.ph/ceng
72.	Mapúa University (Private)	Email: helpdesk@mapua.edu.ph Tel. No: +63(2) 8247-5000 Website: https://www.mapua.edu.ph/
73.	Mariano Marcos State University (State and Local)	Email: coe@mmsu.edu.ph Tel. No: (077) 600-0459 Website: https://www.mmsu.edu.ph/
74.	Marinduque State College (State and Local)	Email: info.office@mscmarinduque.edu.ph Tel. No: (042) 332 2028 Website: https://www.mscmarinduque.edu.ph/
75.	MATS College of Technology (Private)	Email: https://www.linkedin.com/school/mats-college-of-technology/about/ Tel. No: 082-2253576 loc. 122 Website: https://matscollege.ph
76.	Mindanao State University – Gensan (State and Local)	Email: oc@msugensan.edu.ph Tel. No: (083) 380 7186 Website: https://msugensan.edu.ph/
77.	Mindanao State University - Iligan Institute of Technology (State and Local)	Email: ovcre@g.msuiit.edu.ph Tel. No: (063) 221-4056 Website: https://www.msuiit.edu.ph/
78.	Misamis University (Private)	Email: mis@mu.edu.ph Tel. No: 6388 521 0367 Website: https://www.mu.edu.ph/
79.	Mountain Province State University - Tadian Campus (State and Local)	Email: op@mpspc.edu.ph Tel. No: None available Website: https://mpspc.edu.ph/
80.	New Era University (Private)	Email: info@neu.edu.ph Tel. No: (02) 8981 4221 Website: https://neu.edu.ph/main/
81.	Northern Philippines College for Maritime Science and Technology (Private)	Email: admin@npcmstsfc.com Tel. No: (072) 242 5676

NO.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
		Website: https://www.npcmstsfc.com/
82.	Northwestern University (Private)	Email: nwuofficial@gmail.com Tel. No: (+6377) 670 8607 to 10 Website: https://nwu.edu.ph/
83.	Notre Dame of Dadiangas University (Private)	Email: info@nddu.edu.ph Tel. No: (083) 552 4444 Website: https://www.nddu.edu.ph/
84.	Notre Dame of Marbel University (Private)	Email: president@ndmu.edu.ph Tel. No: (083) 228 3598 Website: https://www.notredameofmarbeluniversity.com/
85.	Nueva Ecija University of Science and Technology – Main (State and Local)	Email: neustmain@neust.edu.ph Tel. No: (44) 464 1532 Website: https://neust.edu.ph/
86.	Nueva Vizcaya State University – Bambang (State and Local)	Email: info@nvsu.edu.ph Tel. No: (078) 392-1111 Website: https://www.nvsu.edu.ph/
87.	Palawan State University (State and Local)	Email: psu_registrar@psu.palawan.edu.ph Tel. No: 048 433 2379 Website: https://psu.palawan.edu.ph/
88.	Pamantasan ng Lungsod ng Maynila (State and Local)	Email: plmwebsite@plm.edu.ph Tel. No: (02) 8643 2500 Website: http://plm.edu.ph/
89.	Pamantasan ng Lungsod ng Valenzuela (State and Local)	Email: https://www.linkedin.com/company/pamantasan-ng-lungsod-ng-valenzuela-main/ Tel. No: (02) 277 6495 Website: http://www.plv.edu.ph/
90.	Patria Sable Corpus College (Private)	Email: info@pscc.edu.ph Tel. No: (078) 305-0711 Website: https://www.lpc.edu.ph/
91.	Polytechnic University of the Philippines (State and Local)	Email: inquire@pup.edu.ph Tel. No: 5335-1718 Website: https://www.pup.edu.ph/
92.	Polytechnic University of the Philippines - Sto. Tomas (State and Local)	Email: stotomas@pup.edu.ph Tel. No: 5335-1777 Website: https://www.pup.edu.ph/stotomas/
93.	Professional Academy of the Philippines (Private)	Email: pclcebu2022@gmail.com Tel. No: (32) 489 9463 Website: https://www.facebook.com/PAPSchoolCebu/
94.	Ramon Magsaysay Technological University – Iba (State and Local)	Email: universitypresident@prmsu.edu.ph Tel. No: (047) 811 1683 Website: https://www.prmsu.edu.ph/
95.	Rizal Technological University (State and Local)	Email: op@rtu.edu.ph Tel. No: (02) 8534 8267 Website: https://www.rtu.edu.ph/

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
96.	Romblon State University (State and Local)	Email: romblonstateu@gmail.com Tel. No: (042) 567-5273 Website: https://rsu.edu.ph/
97.	Saint Francis of Assisi College - Las Piñas City (Private)	Email: info@stfrancis.edu.ph Tel. No: (02) 8800 3131 Website: https://stfrancis.edu.ph/lp/
98.	Saint Joseph Institute of Technology (Private)	Email: message@sjit.edu.ph Tel. No: 0955 607 3311 Website: https://sjit.edu.ph/
99.	Saint Mary's University (Private)	Email: secretariat@smu.edu.ph Tel. No: 078 321 2221 Website: https://smu.edu.ph/
100.	Salazar Colleges of Science and Institute of Technology – Madridejos (Private)	Email: registrarmad@scsit.edu.ph Tel. No: 032-261-0235 Website: https://www.scsit.edu.ph/madridejos-campus
101.	Samar State University (State and Local)	Email: info@ssu.edu.ph Tel. No: (055) 251 2139 Website: https://ssu.edu.ph/
102.	Silliman University (Private)	Email: pres@su.edu.ph Tel. No: 4201901 loc 215 Website: https://su.edu.ph/
103.	Sorsogon State University (State and Local)	Email: ssc@sorsu.edu.ph Tel. No: (056) 211-0103 Website: https://sorsu.edu.ph/
104.	Southern Leyte State University (State and Local)	Email: president@southernleytestateu.edu.ph Tel. No: (053) 382 3294 Website: https://southernleytestateu.edu.ph/index.php/en/
105.	Southern Luzon State University (State and Local)	Email: info@slsu.edu.ph Tel. No: (042) 540 4816 Website: https://www.slsu.edu.ph/
106.	Southern Mindanao Colleges (Private)	Email: None Available Tel. No: (062) 214 4804 Website: https://www.smcpag.com/
107.	Southland College (Private)	Email: https://www.linkedin.com/school/southland-college-kabankalan-city-negros-occidental/about/ Tel. No: (034) 746 7297 Website: https://www.southlandcollege.edu.ph/
108.	St. John Technological College of the Philippines (Private)	Email: sjtcp@sjtcp.edu.ph Tel. No: (02) 8937-99-56 Website: https://sjtcp.edu.ph/
109.	St. Louis University (Private)	Email: uio@slu.edu.ph Tel. No: (+6374) 442.3043 Website: https://www.slu.edu.ph/
110.	STI West Negros University (Private)	Email: stiwnu.coe@wnu.sti.edu.ph Tel. No: (034) 434-4561

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
		Website: https://www.sti.edu/campuses-details.asp?campus_id=V05V
111.	Tarlac State University (State and Local)	Email: helpdesk@tsu.edu.ph Tel. No: (045) 606 8123 Website: https://www.tsu.edu.ph/
112.	Technological Institute of the Philippines (Private)	Email: info@tip.edu.ph Tel. No: (+632) 8911.7199 Website: https://www.tip.edu.ph/
113.	Technological Institute of the Philippines - Quezon City (Private)	Email: info@tip.edu.ph Tel. No: (02) 8911 0964 Website: https://www.tip.edu.ph/
114.	Technological University of the Philippines (State and Local)	Email: tup@tup.edu.ph Tel. No: (+632) 5301.3001 Website: https://www.tup.edu.ph/
115.	Technological University of the Philippines – Taguig (State and Local)	Email: raymund_lozada@tup.edu.ph Tel. No: (02) 8823-2457 loc 104 Website: https://tuft.edu.ph/portal/
116.	Technological University of the Philippines – Visayas (State and Local)	Email: marcfrancis_siason@tup.edu.ph Tel. No: (034) 495 3480 Website: http://www.tupvisayas.edu.ph/
117.	The Lyceum of the Philippines – Laguna (Private)	Email: admissions@lpulaguna.edu.ph Tel. No: (049) 502 8946 Website: https://lpulaguna.edu.ph/
118.	Universal Colleges of Paranaque (Private)	Email: admission.universalcollege@gmail.com Tel. No: 8820 2222 Website: https://www.ucp.edu.ph/index/
119.	University of Antique (State and Local)	Email: ua@antiquespride.edu.ph Tel. No: (036) 543 8161 Website: https://www.antiquespride.edu.ph/
120.	University of Batangas (Private)	Email: registrar@ub.edu.ph Tel. No: (043) 723 1446 Website: https://ub.edu.ph/
121.	University of Bohol (Private)	Email: info@universityofbohol.edu.ph Tel. No: 38 - 4113101 Website: https://www.universityofbohol.edu.ph/
122.	University of Cagayan Valley (Private)	Email: susan.perez-mari@ucv.edu.ph Tel. No: 377-4618 Website: https://www.ucv.edu.ph/
123.	University of Cebu (Private)	Email: main.collegeregistrar@uc.edu.ph Tel. No: (032)255-7777 Website: https://www.universityofcebu.net/
124.	University of Cebu - LapuLapu and Mandaue Campus (Private)	Email: registrar.lm@uc.edu.ph Tel. No: (63-32)345-6666 Website: https://www.universityofcebu.net/p/university-of-cebu-lapu-lapu-and.html#

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
125.	University of Eastern Philippines (State and Local)	Email: uepnsofficial@gmail.com Tel. No: +632 055 2518893 Website: https://uep.edu.ph/
126.	University of Luzon (Private)	Email: contactus@ul.edu.ph Tel. No: (+63) (75) 515-5767 Website: https://ul.edu.ph/
127.	University of Mindanao (Private)	Email: cee@umindanao.edu.ph Tel. No: (082) 227 5456 Website: https://umindanao.edu.ph/
128.	University of Nueva Caceres (Private)	Email: info@unc.edu.ph Tel. No: (054) 472 1862 Website: https://unc.edu.ph/
129.	University of Pangasinan PHINMA Education Network (Private)	Email: info.up@phinmaed.com Tel. No: (075) 522 5635 Website: https://up.phinma.edu.ph/
130.	University of Perpetual Help System DALTA in Calamba (Private)	Email: marketing.calamba@perpetualdalta.edu.ph Tel. No: (049) 834 1159 Website: https://perpetualdalta.edu.ph/calamba/
131.	University of Perpetual Help System DALTA in Las Piñas (Private)	Email: wilfredo.tamayo@perpetualdalta.edu.ph Tel. No: (02) 8872 – 7041 Website: https://perpetualdalta.edu.ph/las-pinas/
132.	University of Perpetual Help System DALTA in Molino (Private)	Email: norie.tansio@perpetualdalta.edu.ph Tel. No: (046) 477 – 0602 Website: https://perpetualdalta.edu.ph/molino-2/
133.	University of Perpetual Help System JONELTA in Biñan City (Private)	Email: marketing@uphsl.edu.ph Tel. No: (049) 531 4775 Website: https://www.uphsl.edu.ph/
134.	University of Rizal System - Morong Campus (State and Local)	Email: urs.opmorong@urs.edu.ph Tel. No: (02) 8539-9950 Website: https://www.urs.edu.ph/
135.	University of Saint Louis (Private)	Email: seaitedean@usl.edu.ph Tel. No: (078) 844-1822-201 Website: https://usl.edu.ph/
136.	University of San Carlos (Private)	Email: info@usc.edu.ph Tel. No: (32) 401 2300 Website: https://usc.edu.ph/
137.	University of San Jose-Recoletos (Private)	Email: external@usjr.edu.ph Tel. No: (032) 253 7900 Website: https://usjr.edu.ph/
138.	University of Santo Tomas (Private)	Email: inquiries@ust.edu.ph Tel. No: (02) 3406 1611 Website: https://www.ust.edu.ph/
139.	University of Science and Technology of Southern Philippines (State and Local)	Email: president.office@ustp.edu.ph Tel. No: (088) 856 1738 Website: https://www.ustp.edu.ph/

N0.	UNIVERSITY/ COLLEGE	CONTACT DETAILS
140.	University of Southeastern Philippines (State and Local)	Email: coe@usep.edu.ph Tel. No: (082) 227 8192 Website: https://www.usep.edu.ph/
141.	University of Southeastern Philippines - Bislig Campus (State and Local)	Email: coe@usep.edu.ph Tel. No: +6382 227 8192 Website: https://www.usep.edu.ph/bislig/
142.	University of Southern Philippines Foundation (Private)	Email: ask@uspf.edu.ph Tel. No: (032) 265 - 8773 Website: https://uspf.edu.ph/
143.	University of St. La Salle (Private)	Email: lasalle@usls.edu.ph Tel. No: (034) 434 6100 Website: https://www.usls.edu.ph/
144.	University of the East (Private)	Email: jasmin.salazar@ue.edu.ph Tel. No: (02) 8735 5471 Website: https://www.ue.edu.ph/mla/
145.	University of the East – Caloocan (Private)	Email: ceng.cal@ue.edu.ph Tel. No: (02) 8367 4572 oadms@up.edu.ph Website: https://www.ue.edu.ph/cal/
146.	University of the Philippines Diliman (State and Local)	Email: Tel. No: (02) 8981 8500 Website: https://upd.edu.ph/
147.	University of the Philippines Los Banos (State and Local)	Email: uplb@up.edu.ph Tel. No: (049) 536 2928 Website: https://uplb.edu.ph/
148.	University of the Visayas (Private)	Email: info@uv.edu.ph Tel. No: (032) 345-1464 Website: https://www.universityofthevisayas.com/
149.	University of the Visayas - Dalaguete Campus (Private)	Email: uvdalaguete2007@yahoo.com Tel. No: (032) 345-1465 Website: https://www.universityofthevisayas.com/
150.	Urdaneta City University (State and Local)	Email: officeofthepresident@ucu.edu.ph Tel. No: (075) 204 9020 Website: https://ucu.edu.ph/
151.	Western Institute of Technology (Private)	Email: wit@wit.edu.ph Tel. No: (033) 320 0902 Website: http://www.wit.edu.ph/
152.	Western Philippines University (State and Local)	Email: pres.office@wpu.edu.ph Tel. No: 048-433-4367 Website: http://wpu.edu.ph/home/
153.	Xavier University (Private)	Email: hcason@xu.edu.ph Tel. No: (088) 853 9800 Website: https://www.xu.edu.ph/

1.1 B. ACCREDITING BODIES IN THE PHILIPPINES

Accreditation is a process for assessing and upgrading the educational quality of higher education institutions and programs through self-evaluation and peer judgment. It is a system of evaluation based on the standards of an accrediting agency, and a means of assuring and improving the quality of education. The process leads to a grant of accredited status by an accrediting agency and provides public recognition and information on educational quality.

The accrediting bodies in the Philippines specifically for Engineering are divided into two: local or international. Local accreditation bodies pertain to accrediting agencies operating and using standards applicable in the Philippines, three of them are accrediting private institutions in the country while the remaining two cater to public institutions. International accreditation agencies are using international standards for accreditation and usually caters schools not only in the Philippines but also in other countries.

LOCAL ACCREDITING BODIES FOR PRIVATE LOCAL & NATIONAL UNIVERSITIES:

1. Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA) is an accrediting agency for private higher education institutions in the Philippines. It ensures that academic programs offered by member schools meet acceptable standards of quality. Accreditation is voluntary and non-governmental.

2. Philippine Accrediting Association of Schools, Colleges, and Universities (PAASCU) is a private, voluntary accreditation body for private educational institutions in the Philippines. It accredits a wide range of programs in higher education, basic education, and non-degree programs based on quality standards that meet international criteria.

3. Association of Christian Schools, Colleges and Universities- Accrediting Association of the Philippines (ACSCU-AA) is an accrediting agency that focuses on Christian schools, colleges, and universities. Its goal is to promote quality Christian education in the Philippines and to ensure that the accredited Institutions meet national and international standards.

LOCAL ACCREDITING BODIES FOR LOCAL AND STATE UNIVERSITIES:

1. Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACCUP) provides accreditation services primarily to state universities and colleges (SUCs) in the Philippines. Its primary function is to evaluate academic programs based on established criteria to ensure quality and continuous improvement.

2. Association of Local Colleges and Universities Commission on Accreditation (ALCUCOA) ALCUCOA is a nonprofit organization that plays a crucial role in higher education. It is responsible for accrediting colleges and universities (LUCs) in the Philippines ensuring that they meet the standards set by CHED.

INTERNATIONAL ACCREDITING BODIES:

1. Philippine Technological Council (PTC) is the umbrella organization of accredited professional engineering organizations (APOs) in the Philippines. It is recognized as the national

accreditation body for engineering education under the Washington Accord. PTC evaluates and accredits engineering programs to ensure they meet international standards for engineering education.

2. Accreditation Board for Engineering and Technology (ABET) Accredits post-secondary education programs in applied and natural science, computing, engineering, and engineering technology.

3. ASEAN University Network - Quality Assurance (AUN-QA) is the ASEAN quality assurance network in higher education with responsibility of promoting quality assurance, raise the quality of higher education and collaborate between regional and international bodies for the benefit of ASEAN community.

4. International Organization for Standardization (ISO) ISO is an international body that develops and publishes international standards for a variety of industries, including education. In the Philippines, educational institutions pursue ISO certification to ensure their management processes meet international benchmarks for quality assurance.

GOVERNMENT REGULATORY BODIES:

1. Technical Education and Skills Development Authority (TESDA) is a government agency that oversees and accredits technical and vocational education and training (TVET) programs in the Philippines. TESDA sets standards and ensures that TVET institutions meet the competency requirements for technical education.

2. Commission on Higher Education (CHED) While it is not a typical accreditation body, CHED sets policies, standards, and guidelines for universities and colleges and monitors compliance with these standards.

3. Department of Education (DepEd) Similar to CHED but focusing on basic education (K-12), DepEd ensures that schools meet national standards. While it is not an accreditor in the strict sense, it licenses and monitors schools, particularly elementary and secondary education.

4. Department of Labor (DOLE) - promote gainful employment opportunities, develop human resources, protect workers and promote their welfare and maintain industrial peace. Decent and productive employment for every Filipino worker

5. Civil Service Commission (CSC) - Administer and enforce the constitutional and statutory provisions on the merit system for all levels and ranks in the Civil Service; Prescribe, amend and enforce rules and regulations for carrying into effect the provisions of the Civil Service Laws and other pertinent laws

1.2 A. CORE /PROFESSIONAL SUBJECTS

The degree program described herein shall be called Bachelor of Science in Electrical Engineering (BSEE).

DEFINITION OF PROGRAM:

Electrical Engineering is a profession that involves the conceptualization, development, design and application of safe, healthy, ethical, economical and sustainable generation, transmission, distribution and utilization of electrical energy for the benefit of society and the environment through

the knowledge of mathematics, physical sciences, information technology and other allied sciences, gained by study, research and practice.

Electrical Engineering is one of the broader fields of the engineering disciplines both in terms of the range of problems that fall within its purview and in the range of knowledge required to solve these problems.

CURRICULUM DESCRIPTION:

The Electrical Engineering curriculum is designed to meet the BSEE program outcomes stated CMO 88 s.2017. The curriculum shall develop electrical engineers who have a background in mathematics, natural, physical and allied sciences. As such the curriculum contains courses in college-level mathematics, calculus-based physics, chemistry, materials and environmental sciences with emphasis on the development of analytical and creative abilities. The curriculum also contains mandated general education and elective courses as connected to the desired program outcomes. This is to ensure that the electrical engineering graduates can understand and articulate the nature of their special role in society and the impact of their work on the environment. The curriculum is designed to guarantee a certain breadth of knowledge of the Electrical Engineering discipline through a set of core courses and to ensure depth and focus on certain specializations through track elective courses. A minimum of 240 hours of immersion in electrical engineering activities outside the institution and a capstone design project or a research project in electrical engineering are the final requirements of the curriculum.

The curriculum has a minimum total of 168 credit units, comprising of 118 units of technical courses. These technical courses include 12 units of mathematics, 8 units of natural/physical sciences, 7 units of basic engineering sciences, 34 units of allied courses, 51 units of professional courses (common), and 6 units of professional courses (specialized) or electives.

The non-technical courses in accordance with CMO 20 s. 2013 - the new General Education Curriculum (GEC) - consists of 36 units of general education courses distributed as follows: 24 units of core courses, 9 units of GEC electives, and 3 units of Life and Works of Rizal.

The new GEC also includes 8 units of Physical Education (PE), and 6 units of National Service Training Program (NSTP).

Table 2. Core/ Professional Subjects (Based on CHED CMO 88 S.2017)

PROFESSIONAL COURSES	LECTURE HOURS	LAB HOURS	TOTAL UNITS
Numerical Methods and Analysis	2	3	3
EE Law, Codes and Professional Ethics	2	0	2
Electrical Standards and Practices	0	3	1
Electrical Circuits 1	3	3	4
Electrical Circuits 2	3	3	4
Electrical Apparatus and Devices	2	3	3
Electrical Machines 1	2	0	2

PROFESSIONAL COURSES	LECTURE HOURS	LAB HOURS	TOTAL UNITS
Electrical Machines 2	3	3	4
Engineering Mathematics for EE	3	0	3
Electrical Systems and Illumination Engineering Design	3	6	5
Power System Analysis	3	3	4
Fundamentals of Power Plant Engineering Design	0	3	1
Distribution Systems and Substitution Design	2	3	3
Management of Engineering Projects	2	0	2
Research Methods	0	3	1
Research Project or Capstone Design Project	0	3	1
Instrumentation and Control	2	3	3
Feedback Control Systems	2	0	2
Seminars/Colloquia	0	3	1
On the Job Training	2	(240 hours)	2
Electives 1 and 2	6	0	6
Sub-Total	42	45	57

Table 3. Course Description of Professional Courses

COURSE NAME	COURSE DESCRIPTION
NUMERICAL METHODS AND ANALYSIS	This course covers the concepts of numerical analysis and computer software tools in dealing with engineering problems. It includes techniques in finding the roots of an equation, solving systems of linear and non-linear equations, eigenvalue problems, polynomial approximation and interpolation, ordinary and partial differential equations. The Monte-Carlo method, simulation, error propagation and analysis, the methods of least squares and goodness-of-fit tests are also covered.
MANAGEMENT OF ENGINEERING PROJECTS	The course covers the principles of management, theory and practice, various approaches to decision making, managing production and services operations; and project management Emphasis is also given on the managerial functions of planning, organizing, staffing, leading and controlling.
EE LAW, CODES, AND PROFESSIONAL ETHICS	The course is designed to prepare electrical engineering students for professional practice. Topics include education and practice of the New Electrical Engineering Law and other laws governing the profession, Philippine Grid Code, Philippine Distribution Code, Basic Contracts and ethics in relation to the practice of the electrical engineering profession.
ELECTRICAL STANDARDS AND PRACTICES	This course provides the different electrical practices in accordance with local and international standards.

COURSE NAME	COURSE DESCRIPTION
ELECTRICAL CIRCUITS 1	The course covers nodal and mesh analysis; application of network theorems in circuit analysis; analysis of circuits with controlled sources and ideal op-amps; fundamentals of capacitors and inductors; analysis of de-driven RL, RC, and RLC circuits; sinusoidal steady-state analysis of general RLC circuits
ELECTRICAL CIRCUITS 2	The course deals with sinusoidal steady-state analysis in the frequency domain; AC circuit power analysis; analysis of polyphase circuits and magnetically coupled circuits; frequency response; per unit system and symmetrical components; and two-port networks
ELECTRICAL MACHINES 1	The course deals with the fundamentals of DC machinery; DC motors and generators
ELECTRICAL APPARATUS AND DEVICES	This course provides characteristics, principle of operation, and applications of single-phase and three-phase transformers, and protective devices such as fuses and circuit breakers. It includes various types of transformers based on different criteria, types of fuses and circuit breakers, parallel operation of transformers
ELECTRICAL MACHINES 2	The course deals with the fundamentals of AC machinery; synchronous generators and motors; induction motors; single- Phase and special-purpose motors
ENGINEERING MATHEMATICS FOR EE	The study of mathematical methods for solving engineering problems such as complex number, complex variables, Cauchy- Riemann equations, Laplace transformation and Laplace transform analysis, Fourier series and Fourier transform, z transform, power series solutions of ordinary differential equations, partial differential equation, and hypergeometric equations such as Legendre and Bessel functions
ELECTRICAL SYSTEMS and ILLUMINATION ENGINEERING DESIGN	The course provides knowledge, understanding and skills in electrical wiring and illumination system for residential, commercial, industrial
POWER SYSTEMS ANALYSIS	This course deals with the study on the basic structure of power systems, recent trends and innovations in power systems, transmission line parameters, network modeling and calculations, load flow studies, short circuit calculations and use of computer software for simulation
FUNDAMENTALS OF POWER PLANT ENGINEERING DESIGN	It covers topics on load graphics, types of power plants, power plant operation and protection, interconnections, economics of electric service, and arrangement of equipment for modern plants and includes the design of a power plant, its interconnection, operation, economics, and protection.
DISTRIBUTION SYSTEMS AND SUBSTATION DESIGN	The course deals with study and design of primary and secondary distribution networks, load characteristics, voltage regulation, metering techniques and systems, and protection of distribution systems.
RESEARCH METHODS	This course covers the study of the methodologies used in conducting engineering research. It includes the types and application of research, characteristics of a good research, research design, research instrument and data gathering procedures. It also deals with the study of writing a research proposal and various formats.

COURSE NAME	COURSE DESCRIPTION
INSTRUMENTATION AND CONTROL	The course deals with the study on control and testing: electromechanical, analog and digital measuring and testing instruments: R, L and C measurements: calibration; graphic and waveform analyzing instruments; detectors for the measurements of process variables; analysis of performance characteristics of control systems; electronics, magnetic, hydraulic and mechanical control. It includes principles of controls and test measurements involving sensors, pneumatic controls, actuators, thermal detectors, thermocouples, thermistors, transducers, PIO controllers.
FEEDBACK AND CONTROL SYSTEM	This course deals with the basics of control systems; terminologies and diagrams; homogeneous and transient responses of systems; systems representation such as transfer functions, state-space analysis of phase variables and techniques, nth order linear differential equations; modeling, pole-zero gain data and frequency response data; Laplace transforms; block diagrams interconnections and simplifications; signal flow graphs; conversion of block diagrams to signal flow graphs and vice versa; root locus; Bode, Nyquist and Polar plots; PIO controllers; sensitivity and stability criteria; linear feedback systems; and compensation techniques
TECHNOPRENEURSHIP 101	<i>Technopreneurship is a philosophy, a way of building a career or perspective in life.</i> The course covers the value of professional and life skills in entrepreneurial thought, investment decisions, and action that students can utilize in starting technology companies or executing R&D projects in companies as they start their careers. The net result is a positive outlook towards wealth creation, high value adding, and wellness in society.
SEMINARS AND COLLOQUIA	The course involves the attendance and participation of EE graduating students in technical seminars/workshops related to the field of Electrical Engineering. Students are also required to attend non-technical seminars and training for the enhancement of their personality. It also involves short lectures on current trends and recent developments in the EE field. It may include educational visits to selected companies and manufacturing plants.
ON-THE-JOB TRAINING	Industry exposure of students for them to match school acquired competencies and knowledge with the realities and problems of industry. This may include involvement in industry manpower requirements, development and research concerns, training, and applications of principles, environmental concerns, ethical and behavioral concerns, decision-making, equipment and materials management. The student shall prepare a thesis on a topic covered by his/her experiences.

1.2 B. CURRICULUM OVERVIEW

DURATION AND STRUCTURE OF PROGRAMS

Philippine higher education institutions adopt a semester term, although a few HEIs are authorized to implement trimestral or quarterly terms. The duration of undergraduate study varies. Most of the bachelor or undergraduate programs have a 4-year duration; two programs (architecture and pharmacy) take 5 years to complete, and two programs (dentistry and veterinary medicine) have a 6-year duration. The number of years corresponds to the applicable term in an HEI (i.e. semester, trimester, quarterly).

CHED recognizes and supports both conventional and non-conventional modes of delivery in higher education. The conventional mode entails traditional face to face classroom interaction between

the learners and the faculty members. The common approach involves a variety of instructional methods such as lectures, laboratory experiments, demonstrations, visualization exercise, concept maps, film showing, class and group discussions, problem solving exercises, computer modeling, field trips, tutorials, among others.

Higher education degrees may also be obtained through the following non-conventional models of learning being implemented in the country: 1) open and distance learning (ODL); 2) ladderized education programs; 3) Expanded Tertiary Education Equivalency and Accreditation Program (ETEEAP); and 4) transnational education (TNE) programs.

UNDERGRADUATE EDUCATION:

Undergraduate degree programs in the Philippines are located in Level VI of the Philippine Qualifications Framework.

Their graduates must be able to demonstrate broad and coherent knowledge and skills in their field of study for professional work; apply their knowledge in professional/creative work or research in a specialized field of discipline and/or further study; and be able to work with a substantial degree of independence and or/in teams of individuals in related fields with minimal supervision.

Apart from acquiring undergraduate degrees, passing the licensure examination is an additional PQF Level VI requirement for graduates of disciplines regulated by the Professional Regulation Commission. Without a license, such graduates are not eligible to work in their chosen regulated profession in the Philippines although their baccalaureate degree may qualify them for employment in related professions or in the same profession in countries that do not require a professional license.

EXPANDED TERTIARY EDUCATION EQUIVALENCY AND ACCREDITATION PROGRAM (ETEEAP)

The ETEEAP, or the Expanded Tertiary Education Equivalency and Accreditation Program, is a program developed and promoted by the Commission of Higher Education. This alternative learning program is geared towards working professionals who have not enrolled for or completed their bachelor's degree. The ETEEAP program will serve as the substitute for traditional schooling methods.

The objective of this program is to give individuals with at least five (5) years or more of working experience a bachelor's degree without going through traditional schooling methods. The ETEEAP acknowledges the knowledge, experiences, and achievements these individuals have obtained in their respective careers and allows them to use these towards school credits. These can then be deducted from the number of units they are required to accomplish before they graduate. Anyone with at least a high school diploma or the PEPT placement equivalent to the first year of college is permitted to enroll. Candidates must have been employed for an aggregate minimum of five (5) years in the industry relevant to the course applied and must at least be 25 years of age.

GRADUATE EDUCATION:

Graduate education in the Philippines is expected to achieve a clear progression beyond baccalaureate/undergraduate education by underscoring integrative and interrogative teaching and learning contents and methods and recognizably higher competencies in knowledge production (research), knowledge transmission (teaching) and knowledge application (professional practice, vocational arts, technology).

Master's and doctoral programs in the Philippines have two tracks: Academic or Research Track (PhD by Research) and a Professional Track. Since the Philippine higher education system is heavily influenced by the United States, Master's or PhD degrees by research is a relatively recent development. The prevailing graduate curriculum is based on coursework with thesis/dissertation.

Table 4. Structure and Duration for Electrical Engineering Programs

STRUCTURE	DURATION
Bachelor Degree	4 years
Masteral Degree	2-3 years
Doctorate Degree	4-5 years

1.3 A. CONTINUING EDUCATION

REQUIREMENTS FOR PROFESSIONAL DEVELOPMENT AS MANDATED BY THE PROFESSIONAL REGULATION COMMISSION (PRC)

The Professional Regulation Commission (PRC) in the Philippines mandates that professionals engage in Continuous Professional Development (CPD) as a requirement for the renewal of their Professional Identification Cards (PIC). Here are the general requirements and key points regarding CPD as mandated by the PRC:

1.3 B. APPROVED COURSES AND TRAINING PROGRAMS PROVIDED BY INSTITUTIONS LIKE THE INSTITUTE OF INTEGRATED ELECTRICAL ENGINEERS OF THE PHILIPPINES (IIEE)

The Institute of Integrated Electrical Engineers of the Philippines, Inc. (IIEE) is a recognized professional organization for electrical engineers in the Philippines. The IIEE provides a range of CPD-accredited courses and training programs that are approved by the Professional Regulation Commission (PRC). These programs are designed to help electrical engineers meet their CPD requirements for the renewal of their Professional Identification Cards (PIC) and to enhance their professional skills and knowledge.

1. **Power Systems Design and Analysis:** This course covers advanced topics in power system planning, design, and analysis, including load flow studies, fault analysis, and power system stability.
2. **Electrical Safety and Risk Management:** Focuses on the principles of electrical safety, risk assessment, and the implementation of safety protocols in electrical installations and maintenance.
3. **Renewable Energy Systems:** Provides knowledge on the design, integration, and management of renewable energy sources such as solar, wind, and hydroelectric systems.
4. **Automation and Control Systems:** Covers the fundamentals of automation technologies, PLC programming, and the integration of control systems in industrial applications.
5. **Updates on the Philippine Electrical Code (PEC):** Regular updates and reviews of the latest revisions to the PEC, ensuring that engineers are compliant with current standards.
6. **Energy Management and Audit:** Training on energy management principles, techniques for conducting energy audits, and implementing energy efficiency measures.

7. **Building Electrical Systems Design:** Focuses on the design and implementation of electrical systems in residential, commercial, and industrial buildings, including lighting, power distribution, and fire alarm systems.
8. **Project Management for Electrical Engineers:** Equips engineers with project management skills tailored to the needs of the electrical engineering industry, covering topics like project planning, scheduling, and resource management.
9. **Leadership and Management in Engineering:** Aims to develop leadership skills among engineers, focusing on effective team management, decision-making, and strategic planning.
10. **Sustainable Engineering Practices:** Offers insights into sustainable practices in electrical engineering, including green building design, sustainable energy systems, and environmental impact assessments.

CERTIFICATION PROGRAMS

1. Certified Electrical Practitioner (CEP): A program that provides certification for electrical engineers in specialized areas, such as electrical design, safety, and renewable energy.

2. Accredited Energy Manager (AEM): Certification focused on energy management and efficiency, recognized by both the IIEE and the PRC.

CONVENTIONS AND CONFERENCES

1. Annual National Convention (ANC): IIEE's flagship event, which includes technical sessions, workshops, and forums on the latest trends and innovations in electrical engineering.

2. Regional Conferences: Smaller-scale conferences held in different regions, offering localized content relevant to the needs of engineers in specific areas.

ONLINE TRAINING PROGRAMS

1. Webinars on Emerging Technologies: Regularly conducted webinars on cutting-edge technologies in electrical engineering, such as smart grids, IoT in power systems, and electric vehicles.

2. Distance Learning Modules: Online courses that allow engineers to complete CPD units at their own pace, covering a variety of topics relevant to the electrical engineering field.

SECTION

2

**LICENSURE
AND
REGULATORY
LAWS**

SECTION 2: LICENSURE AND REGULATORY LAWS

2.1 LICENSURE

LICENSING AUTHORITIES :

The field of electrical engineering in the Philippines is regulated by strict licensure laws to ensure that only qualified professionals are allowed to practice and undertake projects that involve the design, construction, and maintenance of electrical systems. These regulations are vital to safeguard the public interest, promote safety, and uphold standards of competency within the industry.

Licensing authorities play a crucial role in overseeing the licensure process for electrical engineers. The **Professional Regulation Commission (PRC)** is the primary regulatory body responsible for issuing licenses to qualified individuals in various professions, including electrical engineering. The **Board of Electrical Engineering**, under the supervision of the PRC, is specifically tasked with setting standards for licensure and regulating the practice of electrical engineering in the country.

LICENSURE REQUIREMENTS

Table 5. Qualification of Applicant for Professional Electrical Engineer and Registered Electrical Engineer

PROFESSIONAL ELECTRICAL ENGINEER	REGISTERED ELECTRICAL ENGINEER
1. Citizen of the Philippines 2. He is of good reputation with high moral values. 3. He has not been finally convicted by the court of and offense involving moral turpitude. 4. Holder of the degree of Bachelor of science in Electrical Engineering (BSEE) from anniversary, school, college, academy or institute duly constituted, recognized and accredited by the Philippine government. 5. A Registered Electrical Engineer, with valid certificate of registration and professional license and with four (4) years or more of active practice reckoned from the date of his registration as registered electrical engineer.	1. Citizen of the Philippines 2. He is of good reputation with high moral values. 3. He has not been finally convicted by the court of and offense involving moral turpitude. 4. Holder of the degree of Bachelor of science in Electrical Engineering (BSEE) from anniversary, school, college, academy or institute duly constituted, recognized and accredited by the Philippine government.

Table 6. Scope of Examination

REGISTERED ELECTRICAL ENGINEER (WRITTEN EXAMINATION)		PROFESSIONAL ELECTRICAL ENGINEER (ORAL OR INTERVIEW)
1. Mathematics	• 25%	1. Certified Experience Record
2. Engineering Sciences and Allied Subjects	• 30%	2. Technical Engineering Report/Thesis/Dissertation Paper
3. Electrical Engineering Professional Subject	• 45%	3. Three (3) Certification signed by Professional Electrical Engineer (vouching PEE)
• Registered Electrical Engineer (REE) - The applicant shall pass a written examination on different subjects or groups of subjects and obtain an average of seventy percent (70%) or above. • Professional Electrical Engineer (PEE) - The applicant shall establish to the satisfaction of the Board of Electrical Engineering and subject to oral examination or interview.		

RENEWAL OF PROFESSIONAL LICENSE

The Professional License shall be renewed every three (3) years of the birth month of the PEE and REE upon compliance with the Continuing Professional Development (Republic Act No. 10912) requirement, unless exempted therefrom, and upon payment of the annual registration fees for three (3) years.

FIELD OF PRACTICE:

- **Professional Electrical Engineer's (PEE)** field of practice includes the sole authority to seal electrical plans, etc., and to practice electrical engineering in its full scope as defined in this Act.
- **Registered Electrical Engineer's (REE)** field of practice includes charge or supervision of operation and maintenance of electrical equipment in power plants, industrial plants, watercraft, electric locomotive, and others; manufacture and repair of electrical supply and utilization equipment including switchboards, power transformers, generators, motors, apparatus, and others; teaching of electrical subjects; and sale and distribution of electrical equipment and systems requiring engineering circulations or application of engineering data.

2.2 REGULATORY LAWS

Regulatory laws also cover the registration of electrical engineering firms and the accreditation of electrical engineering programs in academic institutions. These measures aim to promote accountability, quality assurance, and continuous professional development within the field of electrical engineering.

Republic Act No. 7920 (Electrical Engineering Law of 1995): This law establishes the Professional Regulation Commission (PRC) as the regulatory body responsible for overseeing the licensure and practice of electrical engineers in the country. It outlines the qualifications, responsibilities, and scope of practice for licensed electrical engineers, setting the standards for ethical conduct and professional competency within the profession.

Implementing Rules and Regulations (IRR) by the Board of Electrical Engineering (Board Resolution No. 18 Series of 1995): This further elaborate on the specific procedures, guidelines, and standards for the licensure and regulation of electrical engineers in the Philippines. The

IRR provide detailed information on the application process, examination requirements, renewal of licenses, and code of ethics that licensed electrical engineers must adhere to in their practice.

Code of Ethics for Electrical Engineers of the Philippines (Board Resolution No. 22 Series of 1995): A set of moral principles or values that govern the conduct of an individual belonging to a group of profession. The Electrical Engineer shall observe such a system of moral principles and values as a set of dynamic standards to guide his conduct and way of life. It is his duty to practice his profession according to this Code of Ethics.

Republic Act No. 10912 (Continuing Professional Development Act of 2016), also known as Republic Act No. 10912, mandates that licensed professionals, including electrical engineers, must undergo continuing education and training to renew their licenses. This law aims to promote skills and learning, enhance professional skills, and ensure that licensed professionals stay updated on the latest developments in their field.

Philippine Qualifications Framework (Republic Act. No. 10968) - describes the levels of educational qualifications and sets the standards for qualification outcomes. It is a quality assured national system for the development, recognition and award of qualifications based on standards of knowledge, skills and values acquired in different ways and methods by learners and workers of the country.

SECTION

3

CODES AND STANDARDS UTILIZATION IN THE PHILIPPINES

SECTION 3: CODES AND STANDARDS UTILIZATION IN THE PHILIPPINES

This section provides a comprehensive overview of the adoption and implementation of various international and national codes and standards in the Philippines, focusing on electrical systems.

3.1 INTERNATIONAL STANDARDS

The Philippines actively adopts international standards from prominent global organizations such as the **International Electrotechnical Commission (IEC)** and the **Institute of Electrical and Electronics Engineers (IEEE)**. These standards are adopted and implemented through various regulatory bodies such as the **Bureau of Philippine Standards (BPS)**, **Energy Regulatory Commission (ERC)**, and the **Philippine Electrical Code (PEC)**. Below is a tabulated matrix outlining key IEC and IEEE standards adopted in the Philippines, including their **implementation** and **compliance** details.

3.2 STANDARDS MATRIX FOR ELECTRICAL SYSTEMS IN THE PHILIPPINES

STANDARD BODY	STANDARD CODE	STANDARD TITLE	ADOPTED PHILIPPINE STANDARD	SCOPE/KEY AREAS	IMPLEMENTATION & COMPLIANCE
IEC	IEC 60364-1:2020	Low-voltage Electrical Installations - Part 1: Fundamental Principles, Assessment of General Characteristics	PNS IEC 60364-1:2020	Fundamental principles for the safety of low-voltage electrical installations.	Voluntary
IEC	IEC 60364-4-41:2021	Low/voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	PNS IEC 60364-4-41:2021	Protection against electric shock in low-voltage installations.	Voluntary
IEC	IEC 60364-4-42:2021	Low/voltage electrical installations - Part 4-42: Protection for safety - Protection against thermal effects	PNS IEC 60364-4-42:2021	Protection against thermal effects in low-voltage installations.	Voluntary
IEC	IEC 60364-4-43:2021	Low/voltage electrical installations - Part 4-43: Protection for	PNS IEC 60364-4-43:2021	Protection against overcurrent in low-voltage installations.	Voluntary

STANDARD BODY	STANDARD CODE	STANDARD TITLE	ADOPTED PHILIPPINE STANDARD	SCOPE/KEY AREAS	IMPLEMENTATION & COMPLIANCE
		safety - Protection against overcurrent			
IEC	IEC 60364-4-44:2021 Amd.1:2021	Low/voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	PNS IEC 60364-4-44:2021 Amd.1:2021	Protection against voltage disturbance and electromagnetic disturbance in low-voltage installations.	Voluntary
IEC	IEC 60364-5-52:2023	Low/voltage electrical installations - Part 5-52: Selection and erection of electrical equipment - Wiring systems	PNS IEC 60364-5-52:2023	Selection, sizing and erection of wiring systems in low voltage installation	Voluntary
IEC	IEC 60364-7-710:2023	Low/voltage electrical installations - Part 7-710: Requirements for special installations or locations - Medical locations	PNS IEC 60364-7-710:2023	Requirements for special installations or locations - Medical locations	Voluntary
IEC	IEC 60364-7-712:2023	Low/voltage electrical installations - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems	PNS IEC 60364-7-712:2023	Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems	Voluntary
IEC	IEC 60364-7-722:2023	Low/voltage electrical installations - Part 7-722: Requirements for special installations or	PNS IEC 60364-7-722:2023	Requirements for special installations or locations - Supplies for electric vehicles	Voluntary

STANDARD BODY	STANDARD CODE	STANDARD TITLE	ADOPTED PHILIPPINE STANDARD	SCOPE/KEY AREAS	IMPLEMENTATION & COMPLIANCE
		locations - Supplies for electric vehicles			
IEC	IEC 60364-8-1:2022	Low/voltage electrical installations - Part 8-1: Functional aspects - Energy efficiency	PNS IEC 60364-8-1:2022	Functional aspects - Energy efficiency	Voluntary
IEC	IEC 60034-5:2023	Rotating Electrical Machines - Part 5: Degrees of Protection Provided by Enclosures (IP Code)	PNS IEC 60034-5:2023	Protection against dust, water, and foreign objects for rotating electrical machines.	Compliance required by ERC for industrial equipment safety certifications.
IEC	IEC 60204-1:2018	Safety of Machinery: Electrical Equipment of Machines - Part 1: General Requirements	PNS IEC 60204-1:2018	General requirements for the safety of electrical machinery.	Implemented by BPS and LGUs, particularly in manufacturing sectors; compliance necessary for machinery certification.
IEC	IEC 60898-1:2020	Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation	PNS IEC 60898-1:2020	Requirements for circuit breakers designed for overcurrent protection in household and commercial buildings.	Compliance mandatory for residential/commercial installations; enforced during final electrical inspections.
IEC	IEC 60947-2:2022	Low-Voltage Switchgear and Controlgear: Part 2 – Circuit Breakers	PNS IEC 60947-2:2022	Performance, testing, and safety criteria for circuit breakers in industrial/commercial settings.	Compliance required in industrial settings; inspected by BPS and certified by ERC.
IEEE	IEEE 519:2014	Recommended Practice and Requirements for Harmonic Control in Electric Power	Referenced by ERC/NGCP	Guidelines for controlling harmonic distortion in power systems.	Compliance enforced by ERC and NGCP; harmonic analysis required for grid-connected facilities and power quality

STANDARD BODY	STANDARD CODE	STANDARD TITLE	ADOPTED PHILIPPINE STANDARD	SCOPE/KEY AREAS	IMPLEMENTATION & COMPLIANCE
		Systems			certification.
IEEE	IEEE 1584:2018	Guide for Performing Arc-Flash Hazard Calculations	Referenced by Occupational Safety Guidelines	Arc-flash hazard assessment to ensure the safety of personnel in high-energy electrical systems.	Compliance mandated in high-energy industrial facilities; enforced by DOLE and safety inspectors in coordination with ERC.
IEEE	IEEE 1100:2022	Recommended Practice for Powering and Grounding Electronic Equipment	Referenced by PEC	Guidelines for grounding and bonding electronic equipment to ensure system reliability.	Compliance enforced by BPS and LGUs, particularly in critical facilities such as hospitals and data centers.
IEEE	IEEE C57.12.00:2021	Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers	Used by NPC and utilities	General requirements for transformers to ensure safety and reliability in power systems.	Compliance required for transformer procurement and installation; inspected by ERC and utilities for adherence to specifications.
IEEE	IEEE 80:2013	Guide for Safety in AC Substation Grounding	Referenced by Grid Code and Distribution Code	Guidelines for designing safe grounding systems in AC substations.	Compliance mandatory for all substation projects; enforced by NGCP and inspected by ERC for grid and substation projects.

3.3 NATIONAL STANDARDS AND REGULATORY BODIES

The national standards in the Philippines are primarily governed by the **Philippine Electrical Code (PEC)**, which sets the requirements for the safe design, installation, and maintenance of electrical systems across the country. The PEC, aligned with international standards, incorporates local provisions that address the unique conditions in the Philippines.

- **Philippine Electrical Code (PEC):** Provides mandatory guidelines for wiring installations, grounding, and protection against hazards.
- **National Building Code of the Philippines (NBCP):** Contains provisions for electrical installations that complement the PEC.

3.4 KEY DIFFERENCES BETWEEN THE PHILIPPINE ELECTRICAL CODE AND INTERNATIONAL STANDARDS

ASPECT	PEC (PHILIPPINES)	INTERNATIONAL STANDARDS (IEC/IEEE)
Adoption	Legally mandated and enforced by regulatory bodies such as the DOE, PRC, and LGUs	Generally voluntary and applied based on industry needs and regulations.
Scope and Focus	Primarily focuses on electrical safety and practices tailored to local conditions	Covers a broader range of global electrical engineering topics and applications.
Units of Measure	Uses the metric system (SI units)	Predominantly metric but may include imperial units, particularly in older or U.S. standards.
Updates	Periodically updated based on local needs and incidents	Continuously revised to reflect global advancements in electrical engineering.

SECTION

4

LOCAL LAWS ON PERMITS

SECTION 4: LOCAL LAWS ON PERMITS

4.1 PERMIT REQUIREMENTS

The legal framework governing electrical installations is designed to ensure safety, reliability, and compliance with National Building Code of the Philippines (PD 1096). This system is primarily anchored by the Philippine Electrical Code (PEC), established under Republic Act No. 7920, known as the "New Electrical Engineering Law." The PEC outlines the standards and practices for electrical installations, aiming to safeguard life and property from electrical hazards.

PERMIT	CERTIFICATE
1. Electrical Permit or Wiring Permit	1. Certificate of Final Electrical Inspection
2. Temporary Electrical Permit	2. Temporary Certificate of Electrical Inspection

A. Requirements for Obtaining Electrical/Wiring Permits and Temporary Electrical Permit

- Duly accomplished and signed application form
- Five (5) sets of complete electrical plan and specification, duly signed and sealed by a Professional Electrical Engineer Detailed drawings prepared by a licensed electrical engineer or a qualified electrician. These plans must outline the layout, load calculations, and specifications of the electrical system, ensuring compliance with the PEC.
- Bill of Materials: A comprehensive list detailing all materials and equipment intended for use in the installation. This list helps inspectors verify that the project will meet safety standards.
- Contractor's License: If the work is to be performed by a contractor, proof of the contractor's license and registration with the Professional Regulation Commission (PRC) is mandatory. This ensures that the contractor is qualified and legally authorized to perform electrical work.
- Proof of ownership (e.g. certified true copy of Transfer Certificate of Title)
- Inspection Fees: Payment of the necessary fees associated with the permit application. These fees may vary by locality and are used to cover the costs of inspections and administrative processing.

B. Requirements for Obtaining Certificate of Final and Temporary Electrical Inspection

- Duly accomplished completion form
- Photocopy of electrical permit
- Approved electrical plans.
- Revised Electrical plans (As-built plan)
- Electrical Test Results
- Certification from Professional Electrical Engineer, certifying the safe and sound of the electrical installation and equipment installed.

C. Rules and Regulations Governing the Licensing of Construction Permits in the Philippines

- **Republic Act. No. 6541 or An Act to Ordain and Institute a National Building Code of the Philippines** – is a law that answers the demand for urbanization. It aims

to ensure the developers will follow the implementation of the latest technical knowledge on building design, construction, occupancy, maintenance and use.

- **National Building Code of the Philippines (PD 1096)** - it is hereby declared to be the policy of the State to safeguard life, health, property, and public welfare, consistent with the principles of sound environmental management and control; and to this end, make it the purpose of this code provides for all buildings and structures, a framework of minimum standards and requirements to regulate and control their location. Site, design quality of materials, construction, use, occupancy, and maintenance.

Referral Codes and Laws

- Department of Public Works and Highways (DPWH Department Order)
- DILG-DPWH-DICT-DTI Joint Memorandum Circular No. 2018-01, Jan. 10, 2018)
- Philippine Electrical Code (Professional Regulatory Board of Electrical Engineering Resolution No. 18, Series of 2017)
- Philippine Green Building Code
- Local Government Ordinance
- Ease of Doing Business Law (RA 11032)
- Republic Act 9485

4.2 AUTHORITY TO CONTACT

The process of obtaining electrical permits is governed by a combination of national legislation and local ordinances, with specific authorities responsible for overseeing compliance and enforcement. Understanding the local laws and identifying the correct contacts is essential for anyone looking to undertake electrical work in the country.

The framework for electrical installations in the Philippines is primarily dictated by the Philippine Electrical Code (PEC), established under Republic Act No. 7920. This law mandates safety standards for electrical installations to protect both life and property. Local government units (LGUs) under the Department of Interior and Local Government (DILG) are tasked with implementing these standards, and they play a crucial role in the permitting process.

Department of Public Works and Highways (DPWH)	www.dpwh.gov.ph
Department of Interior and Local Government (DILG)	www.dilg.gov.ph
Bureau of Fire Protection (BFP)	www.bfp.gov.ph
Professional Regulation Commission (PRC)	www.prc.gov.ph
Institute of Integrated Electrical Engineers of the Philippine (IIEE)	www.iiee.org.ph

4.3 INSPECTIONS AND COMPLIANCE

The Philippine Electrical Code (PEC), established under Republic Act No. 7920, serves as the primary regulatory framework for electrical installations. This code sets forth the safety standards and procedures that must be followed. Local government units (LGUs) are responsible for enforcing these standards, ensuring that all electrical work complies with both national and local regulations.

INSPECTION	RESPONSIBLE
Preliminary Inspection	Electrical Permit Section
Rough-in or Task force Inspection	Electrical Enforcement Section
Final Inspection	Electrical Enforcement Section
Annual Electrical Inspection	Electrical Annual Section

SECTION

5

**NOMINAL
VOLTAGES IN
THE
PHILIPPINES**

SECTION 5: NOMINAL VOLTAGES IN THE PHILIPPINES

This section outlines the standardized nominal voltages and frequency used throughout the electrical power system in the Philippines. The country operates with a standard frequency of **60 Hz**, ensuring consistency and compatibility across various stages of the electrical grid.

Table 7 – Nominal Voltage Standards by Application

VOLTAGE CLASSIFICATION	NOMINAL VOLTAGE	APPLICATION	DESCRIPTION
Generation	13.8 kV	Small to medium-sized power plants	Used for local generation needs and small hydroelectric or diesel plants.
	230 kV	Large-scale power plants	Utilized by coal, natural gas, and large hydroelectric power stations for efficient long-distance transmission.
Transmission	115 kV / 138 kV	Medium-distance transmission	Used in regional networks, connecting smaller plants to local substations.
	230 kV	Main transmission grid	Standard high-voltage transmission between large power plants and substations.
	500 kV	Long-distance, high-capacity transmission	Ultra-high voltage for minimal energy losses over extensive distances.
Distribution	13.2 kV / 13.8 kV	Medium-voltage feeders	Distributes power from substations to residential and commercial areas.
	34.5 kV	Urban/industrial distribution	Higher-capacity distribution for larger loads in urban or industrial zones.
	69 kV	Sub-transmission voltage	Distributes power regionally from main substations to smaller distribution substations.
Residential	220 V, Single-Phase	Standard household voltage	Common voltage for household appliances and lighting.
	230 V, Three-Phase	Larger residential properties	Used for heavier loads in larger residential buildings.
	400/230 V, Three-Phase	Mixed-use and mid-rise buildings	400 V for three-phase applications, 230 V for single-phase, providing versatility.
Industrial & Commercial	380 V, Three-Phase	Heavy industrial machinery	Powers heavy machinery, providing better efficiency for large electrical motors.
	400 V, Three-Phase	Industrial/commercial applications	Common voltage for industrial and commercial establishments, especially for imported machinery.
	480 V, Three-Phase	High-power equipment in	Supports HVAC systems, large motors, and heavy

VOLTAGE CLASSIFICATION	NOMINAL VOLTAGE	APPLICATION	DESCRIPTION
		commercial/industrial	machinery.
Specialized Sectors	120 V and 240 V, Single-Phase	Specialized installations	Used in military installations or equipment following American voltage standards.
	4.16 kV / 6.6 kV	Mining and marine applications	Powers medium-voltage motors and equipment in mining and marine industries.
	11 kV	Industrial/agricultural applications	Supports irrigation systems and small industrial complexes, improving equipment efficiency.

SECTION

6

ASEAN MUTUAL RECOGNITION ARRANGEMENT (MRA) COMPLIANCE

SECTION 6: ASEAN MUTUAL RECOGNITION ARRANGEMENT(MRA) COMPLIANCE

Mutual Recognition Arrangements (MRAs) are framework arrangements established in support of liberalizing and facilitating trade in services. Mutual Recognition Agreements (MRA) are one of the instruments utilized by ASEAN to remove non-tariff trade barriers and facilitate the free flow of goods in the region to realize the establishment of the ASEAN Economic Community. The MRAs are agreements between Member States that provide for mutual recognition of the results of conformity assessments conducted in one Member State by authorities in the other ASEAN Member States.

There are eight priority sectors having MRAs in the ASEAN region, namely: ASEAN MRA on Interior Design Services, ASEAN MRA on Nursing Service, ASEAN MRA on Medical Practitioners, ASEAN MRA on Dental Practitioners, ASEAN MRA on Accountancy Services, ASEAN MRA on Surveying Qualification, ASEAN MRA on Architectural Services and ASEAN MRA on Engineering Services.

ASEAN MRA on Engineering Services

The objectives of this MRA on Engineering Services are.

1. to facilitate mobility of services of engineering professionals
2. to exchange of information in order to promote adoption of best practices on standards and qualifications.

ASEAN Chartered Professional Engineer (ACPE) A Professional Engineer who possesses the above qualifications and complies with the Guidelines on Criteria and Procedures and satisfies the Assessment Statement, may, upon acceptance and payment of fees, be placed on the ASEAN Chartered Professional Engineers Register (ACPER) and accorded the title of ASEAN Chartered Professional Engineer (ACPE). An ASEAN Chartered Professional Engineer (ACPE) shall practice engineering only in the specific discipline or disciplines in which he/she has been adjudged to be competent under the Arrangement.

Professional Regulatory Authority (PRA) The PRA of the Philippines is the Philippine Regulations Commission (PRC) and the relevant regulatory boards in Engineering.

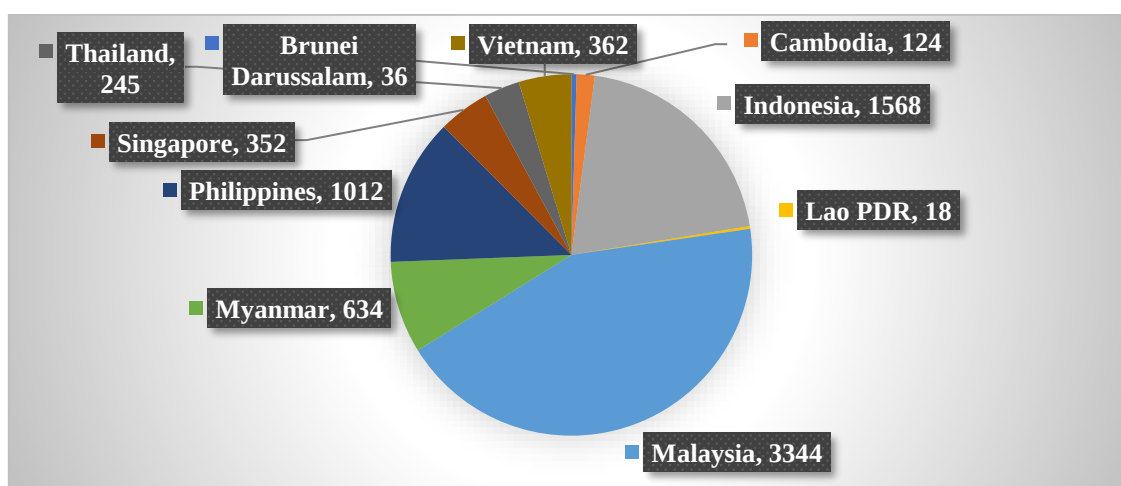
ASEAN Monitoring Committee on Engineering Services of the Philippines (AMCESP) The independent authorized body responsible for assessing, evaluating and certifying the applicant's compliance with the requirements for registration as a Filipino ASEAN Chartered Professional Engineer (FACPE); for registering an ASEAN Chartered Professional Engineer (ACPE) from other ASEAN Member States (AMSs) to work in the Philippines as a Registered Foreign Professional Engineer (RFPE); and for developing, processing and maintaining the Philippine ASEAN Chartered Professional Engineer Register (PACPER).

The AMCESP shall be composed of the following members, each having one (1) voting right:

1. PRC Chairperson or authorized representative.
2. Professional Regulatory Board of Engineering (two (2) members).
3. CHED Chairperson or authorized representative; and
4. PTC President or authorized representative

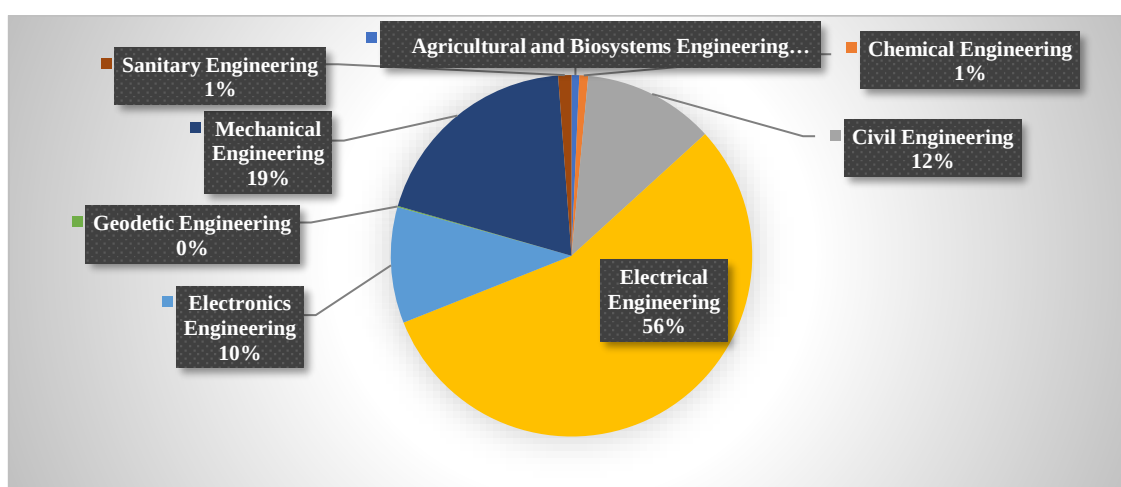
The PRC shall hold permanent chairmanship of the AMCESP.

ASEAN REGION REGISTERED ACPE



PHILIPPINE ASEAN CHARTERED PROFESSIONAL ENGINEERS

PROFESSIONS	TOTAL CUMULATIVE
Engineering (ACPE)	1,012
Aeronautical Engineering	-
Agricultural and Biosystems Engineering	7
Chemical Engineering	8
Civil Engineering	119
Electrical Engineering	564
Electronics Engineering	105
Geodetic Engineering	1
Mechanical Engineering	196
Metallurgical Engineering	-
Mining Engineering	-
Naval Architecture	-
Sanitary Engineering	12



SECTION

7

SAFETY STANDARDS AND PRACTICES

SECTION 7: SAFETY STANDARDS AND PRACTICES

Safety standards and practices provides comprehensive details on the safety standards and practices governing occupational safety and health (OSH) in the Philippines, particularly as they pertain to the electrical engineering industry. It outlines the legislative framework, best practices, safety training requirements, and incident reporting procedures to ensure a safe working environment across various sectors.

7.1 OCCUPATIONAL SAFETY AND HEALTH (OSH)

Republic Act No. 11058, also known as the "Occupational Safety and Health Standards (OSHS) Law." This law mandates comprehensive safety measures to prevent workplace accidents and illnesses, particularly in high-risk industries like electrical engineering.

7.2 OVERVIEW OF ELECTRICAL SAFETY AND ENVIRONMENTAL REGULATIONS

Electrical safety and environmental regulations are fundamental components of the electrical engineering profession. These regulations are designed to ensure the safe operation of electrical systems and to minimize the impact of electrical engineering activities on the environment. By adhering to these standards, professionals in the electrical engineering field can prevent accidents, protect the environment, and promote sustainable development. The ASEAN Electrical Engineering Information Exchange aims to standardize these regulations across member states to foster regional cooperation, improve safety, and support environmental sustainability.

OBJECTIVES

The objectives of this section are to:

1. Provide a comprehensive framework for standardizing electrical safety and environmental regulations in ASEAN countries.
2. Outline key safety standards, environmental regulations, and procedures that can be adopted and adapted by member states.
3. Promote a unified approach to electrical safety and environmental protection, fostering regional ENVIRONMENTAL REGULATIONS

Environmental regulations in the electrical engineering field aim to minimize the ecological footprint of electrical projects. In the Philippines, several key laws and regulations govern the environmental impact of electrical engineering projects:

Environmental Impact Assessment (EIA) and Environmental Compliance Certificate (ECC): According to Presidential Decree No. 1586, electrical engineering projects that are likely to have a significant environmental impact must undergo an Environmental Impact Assessment (EIA). This assessment evaluates potential environmental effects, and projects that meet specific criteria are required to obtain an Environmental Compliance Certificate (ECC) from the Department of Environment and Natural Resources (DENR). This process ensures that projects are planned and executed in a way that minimizes environmental harm, promotes sustainability, and complies with local environmental laws.

Republic Act No. 8749 (Clean Air Act of 1999): The Clean Air Act regulates air emissions from various sources, including generators, power plants, and other electrical systems. It mandates strict compliance with emissions standards and requires the use of best available control technologies to reduce air pollution. This law is crucial for protecting air quality and public health, and by adopting similar standards across ASEAN countries, we can collectively work towards reducing regional air pollution.

Republic Act No. 9275 (Clean Water Act of 2004): This law sets water quality standards and regulates discharges from facilities that may affect water bodies, such as power plants and cooling systems. Electrical engineering projects must comply with these standards to prevent the contamination of water resources, thereby protecting aquatic ecosystems and public health. Standardizing water quality regulations across ASEAN countries will ensure that all member states contribute to the protection of shared water resources.

Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000): This act mandates the proper management of solid waste, including hazardous waste generated from electrical engineering projects. It requires waste minimization, recycling, and safe disposal practices, particularly for hazardous materials like batteries, cables, and electronic components. By adopting similar waste management practices, ASEAN countries can collectively reduce the environmental impact of electrical projects and promote sustainable waste management.

Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990): This law regulates the handling, storage, and disposal of hazardous substances and wastes, ensuring that electrical projects involving materials such as transformers, insulators, and batteries are managed safely. It also mandates an inventory of hazardous materials to prevent environmental contamination and protect public health.

Republic Act No. 9513 (Renewable Energy Act of 2008): This act encourages the use of renewable energy sources in electrical engineering projects, such as solar, wind, and hydropower, to reduce reliance on fossil fuels and mitigate environmental impacts. By promoting the adoption of renewable energy, Philippines can work towards a more sustainable energy future and reduce greenhouse gas emissions.

The information above serves as a framework for standardizing electrical safety and environmental regulations related to the practice of electrical engineering in ASEAN countries. This outline promotes a unified approach to electrical safety and environmental protection.

7.3 ENVIRONMENTAL REGULATIONS

WASTE MANAGEMENT AND DISPOSAL

Proper waste management and disposal are critical for minimizing the environmental impact of electrical engineering projects. Key regulations and practices include:

Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000): This law mandates the proper management of solid waste, including hazardous waste generated from electrical engineering projects. It requires waste minimization, recycling, and safe disposal practices, particularly for hazardous materials like batteries, cables, and electronic components.

Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990): This act regulates the handling, storage, and disposal of hazardous substances and wastes, ensuring that electrical projects involving materials such as transformers, insulators, and batteries are managed safely. It also mandates an inventory of hazardous materials to prevent environmental contamination and protect public health.

EMISSION STANDARDS AND CONTROL MEASURES

Controlling emissions from electrical engineering projects is vital for protecting air quality and public health. Key regulations include:

Republic Act No. 8749 (Clean Air Act of 1999): This law regulates air emissions from various sources, including generators, power plants, and other electrical systems. It mandates strict compliance with emissions standards and requires the use of best available control technologies to reduce air pollution.

ENERGY EFFICIENCY AND CONSERVATION

Promoting energy efficiency and the use of renewable energy sources in electrical engineering projects can significantly reduce environmental impact. Relevant regulations include:

Republic Act No. 9513 (Renewable Energy Act of 2008): This act encourages the use of renewable energy sources in electrical engineering projects, such as solar, wind, and hydropower, to reduce reliance on fossil fuels and mitigate environmental impacts. By promoting the adoption of renewable energy, the Philippines can work towards a more sustainable energy future and reduce greenhouse gas emissions.

Philippine Green Building Code and Energy Efficiency and Conservation Act: Electrical engineering projects must comply with these standards to promote energy-efficient design and the use of environmentally friendly electrical systems. The Energy Efficiency and Conservation Act provides guidelines for the adoption of energy-efficient technologies and the promotion of renewable energy systems in construction projects.

USE OF ENVIRONMENTALLY FRIENDLY MATERIALS

The selection of environmentally friendly materials in electrical engineering projects is essential for reducing environmental impact and promoting sustainability. This includes using materials that are recyclable, non-toxic, and have a low environmental footprint.

COMPLIANCE WITH LOCAL AND INTERNATIONAL ENVIRONMENTAL LAWS

Electrical engineering projects must comply with local and international environmental laws to ensure sustainable practices and protect natural resources. Compliance is essential for project approval and the issuance of necessary permits and certificates, ensuring that projects are designed and implemented in a manner that minimizes their negative environmental impact while promoting sustainability.

The above framework lists the specific electrical safety standards and environmental regulations relevant to the practice of electrical engineering in the Philippines. The list of laws, protocols, and regulations above has its own details as reflected in the references that can be adopted by ASEAN countries to standardize electrical safety and environmental practices. This list of standards will help to enhance safety, protect the environment, and promote sustainable development, benefiting all member states and their citizens under ASEAN Information Exchange.

Table 8. Summary of Environmental Regulations

REGULATION	DESCRIPTION	RELEVANT LAW/STANDARD	PURPOSE
Environmental Impact Assessment (EIA)	Requires an assessment of environmental effects and the issuance of an Environmental Compliance Certificate (ECC)	Presidential Decree No. 1586	Evaluate potential environmental impacts of projects
Clean Air Act	Regulates air emissions from electrical systems and mandates the use of control technologies to minimize pollution	Republic Act No. 8749 (Clean Air Act of 1999)	Reduces air pollution and protects air quality
Clean Water Act	Sets standards for water quality and regulates discharges from electrical installations to prevent contamination	Republic Act No. 9275 (Clean Water Act of 2004)	Protects water resources from contamination
Ecological Solid Waste Management Act	Mandates proper management of solid waste, including hazardous waste from electrical projects	Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000)	Promotes sustainable waste management practices
Toxic Substances and Hazardous and Nuclear Wastes Control Act	Regulates the handling, storage, and disposal of hazardous substances and wastes in electrical projects	Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990)	Prevents environmental contamination from hazardous materials
Renewable Energy Act	Encourages the use of renewable energy sources in electrical projects to reduce reliance on fossil fuels	Republic Act No. 9513 (Renewable Energy Act of 2008)	Promotes sustainable energy use and reduces environmental impact
Philippine Green Building Code	Promotes energy-efficient design and the use of environmentally friendly electrical systems in construction	Philippine Green Building Code, PD No. 1096	Enhances energy efficiency and reduces environmental footprint
Energy Efficiency and Conservation Act	Provides guidelines for the adoption of energy-efficient technologies and renewable energy systems	Republic Act No. 11285 (Energy Efficiency and Conservation Act)	Reduces energy consumption and promotes sustainability

This table summarizes the key environmental regulations relevant to electrical engineering, outlining their descriptions, the relevant laws or standards, and their purposes. It provides a clear overview of how these regulations contribute to environmental protection and sustainability in the context of electrical engineering projects.

7.4 REGULATORY FRAMEWORK IN THE PHILIPPINES

KEY LAWS AND REGULATIONS GOVERNING ELECTRICAL SAFETY

The regulatory framework for electrical safety in the Philippines is guided by a combination of national laws, standards, and codes. These regulations are designed to ensure the safe design, installation, operation, and maintenance of electrical systems across various sectors.

Philippine Electrical Code (PEC): The PEC is the primary regulatory document governing electrical installations in the Philippines. It sets out minimum safety standards for electrical systems, covering aspects such as wiring methods, grounding, equipment specifications, and protective devices.

The PEC is regularly updated to align with international standards and technological advancements, ensuring that electrical installations in the Philippines meet global safety requirements.

Republic Act No. 7920 (New Electrical Engineering Law): This law governs the practice of electrical engineering in the Philippines. It defines the scope of practice for electrical engineers, sets licensure requirements, and establishes standards for professional conduct. The law also mandates compliance with the PEC and other relevant safety regulations, ensuring that all electrical work is performed by qualified professionals.

Occupational Safety and Health Standards (OSHS): The OSHS, implemented by the Department of Labor and Employment (DOLE), includes specific provisions related to electrical safety in the workplace. It covers topics such as electrical hazard identification, personal protective equipment (PPE) requirements, lockout/tagout procedures, and emergency response protocols. These standards are enforced through regular inspections and audits by DOLE, ensuring that employers maintain a safe working environment for their employees.

Republic Act No. 11058 (Occupational Safety and Health Standards Act): This act reinforces the OSHS by mandating comprehensive safety and health programs for all workplaces, including those involving electrical work. It requires employers to provide adequate training, conduct risk assessments, and implement safety measures to protect workers from electrical hazards.

KEY LAWS AND REGULATIONS GOVERNING ENVIRONMENTAL PROTECTION

Environmental protection regulations in the Philippines are designed to minimize the ecological impact of industrial activities, including electrical engineering projects. These regulations cover various aspects of environmental management, from waste disposal to emission control.

Presidential Decree No. 1586 (Philippine Environmental Impact Statement System): This decree requires all projects with potential significant environmental impact, including large-scale electrical installations, to undergo an Environmental Impact Assessment (EIA). Projects that meet specific criteria are required to obtain an Environmental Compliance Certificate (ECC) from the Department of Environment and Natural Resources (DENR) before proceeding. The EIA process ensures that potential environmental impacts are identified and mitigated, promoting sustainable development.

Republic Act No. 8749 (Clean Air Act of 1999): The Clean Air Act sets air quality standards and regulates emissions from various sources, including power plants and other electrical installations. It requires facilities to use the best available control technologies to minimize air pollution and mandates regular monitoring and reporting of emissions. The law aims to protect public health and the environment by reducing air pollution and promoting cleaner technologies.

Republic Act No. 9275 (Clean Water Act of 2004): This law establishes water quality standards and regulates discharges from facilities that may affect water bodies, including those involved in power generation and electrical installations. It mandates the use of appropriate treatment technologies to prevent water pollution and requires regular monitoring and reporting of effluent quality. The Clean Water Act aims to protect water resources and promote sustainable water management practices.

Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000): The Solid Waste Management Act requires proper management of solid waste, including hazardous waste generated by electrical engineering projects. It mandates waste segregation, recycling, and safe disposal practices to minimize environmental impact. The law also encourages the adoption of sustainable waste management practices, such as the use of eco-friendly materials and technologies.

Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990): This law regulates the handling, storage, and disposal of hazardous substances and wastes, including those used in electrical engineering projects. It requires facilities to maintain an inventory of hazardous materials, implement safety measures to prevent contamination, and comply with international standards for hazardous waste management. The law aims to protect public health and the environment from the risks associated with hazardous substances.

Republic Act No. 9513 (Renewable Energy Act of 2008): The Renewable Energy Act promotes the use of renewable energy sources in electrical engineering projects, such as solar, wind, and hydropower. It provides incentives for the development of renewable energy projects and sets targets for increasing the share of renewable energy in the country's energy mix. The law aims to reduce reliance on fossil fuels, mitigate environmental impacts, and promote sustainable energy development.

ROLE OF GOVERNMENT AGENCIES AND PROFESSIONAL BODIES

Several government agencies and professional bodies play a crucial role in enforcing electrical safety and environmental regulations in the Philippines:

Department of Energy (DOE): The DOE oversees the energy sector, including the generation, transmission, and distribution of electricity. It ensures compliance with energy-related regulations and promotes the adoption of renewable energy and energy efficiency practices.

Department of Environment and Natural Resources (DENR): The DENR is responsible for environmental protection and conservation in the Philippines. It administers the EIA process, issues ECCs, and monitors compliance with environmental regulations. The DENR also enforces laws related to air and water quality, waste management, and hazardous substances.

Department of Labor and Employment (DOLE): DOLE enforces occupational safety and health standards, including those related to electrical safety. It conducts regular inspections of workplaces, provides training and technical assistance, and ensures that employers comply with safety regulations.

Professional Regulation Commission, Board of Electrical Engineering (PRC-BEE): The PRC-BEE regulates the practice of electrical engineering in the Philippines. It administers licensure exams, sets standards for professional conduct, and enforces compliance with the Philippine Electrical Code and other relevant regulations.

Institute of Integrated Electrical Engineers of the Philippines (IIEE): The IIEE is the professional organization for electrical engineers in the Philippines. It promotes the advancement of the electrical engineering profession, provides continuing education and training, and advocates for the implementation of safety and environmental regulations.

This section has detailed the regulatory framework governing electrical safety and environmental protection in the Philippines. It has highlighted the key laws, regulations, and standards that ensure the safe and sustainable practice of electrical engineering and discussed the role of government agencies and professional bodies in enforcing these regulations. By aligning the regulatory framework with ASEAN standards, the Philippines can enhance regional cooperation, promote best practices, and contribute to the development of a unified approach to electrical safety and environmental protection in the ASEAN region.

7.5 ALIGNMENT WITH ASEAN STANDARDS

Aligning the regulatory framework of the Philippines with ASEAN standards is crucial for fostering regional integration and cooperation. Key steps to achieve alignment include:

Harmonization of Regulations: Review and update national regulations to align with ASEAN standards and best practices. This includes adopting international standards for electrical safety and environmental protection and ensuring consistency in regulatory requirements across ASEAN countries.

Mutual Recognition of Licenses and Certifications: Establish agreements for the mutual recognition of professional licenses and certifications among ASEAN member states. This facilitates the mobility of electrical engineers and other professionals across the region, promoting cross-border cooperation and knowledge sharing.

Capacity Building and Knowledge Exchange: Strengthen capacity building and knowledge exchange among ASEAN countries through training programs, workshops, and conferences. This helps build a shared understanding of regulatory requirements, promotes best practices, and supports the continuous improvement of safety and environmental standards.

Regional Collaboration on Research and Development: Foster regional collaboration on research and development to address emerging challenges in electrical safety and environmental protection. This includes developing new technologies, sharing data and information, and conducting joint studies on key issues.

To effectively align the Philippines' regulatory framework with those of other ASEAN countries, it is crucial to understand the similarities and differences in electrical safety and environmental regulations across the region.

Electrical Safety Regulations: Most ASEAN countries have established electrical safety regulations based on international standards, such as those set by the International Electrotechnical Commission (IEC) and the National Electrical Code (NEC). However, the scope and stringency of these regulations can vary significantly. For example, Malaysia's Electrical Safety Regulation 1994 and Singapore's Electrical Safety Code are closely aligned with IEC standards, focusing on safe installation practices, equipment certification, and regular maintenance. Thailand's electrical safety regulations emphasize mandatory training and certification of electrical workers, similar to the Philippines' requirements under the Philippine Electrical Code and Republic Act No. 7920. (See Table 4)

Environmental Regulations: Environmental regulations across ASEAN countries also share common goals but differ in their implementation and enforcement. Countries like Singapore and Malaysia have vigorous environmental laws that regulate air and water quality, waste management, and emissions from industrial activities. The Philippines' environmental laws, such as the Clean Air Act (Republic Act No. 8749) and Clean Water Act (Republic Act No. 9275), are comparable to Malaysia's Environmental Quality Act and Singapore's Environmental Protection and Management Act, with all aiming to control pollution and promote sustainable practices. (See Table 5)

Table 9: ASEAN Electrical Safety Regulations Similar to Philippine Standards

COUNTRY	ELECTRICAL SAFETY REGULATION	SIMILAR STANDARDS TO THE PHILIPPINES	REGULATORY REFERENCE
Philippines	Philippine Electrical Code; OSHS; Republic Act No. 7920 (New Electrical Engineering Law); Republic Act No. 11058	Comprehensive electrical safety standards covering installation practices, equipment specifications, PPE requirements,	Philippine Electrical Code; OSHS; RA 7920; RA 11058

COUNTRY	ELECTRICAL SAFETY REGULATION	SIMILAR STANDARDS TO THE PHILIPPINES	REGULATORY REFERENCE
	(OSHS Act)	and worker training.	
Malaysia	Electrical Safety Regulation 1994; Electricity Supply Act 1990 (Amended 2015)	Requires safe installation practices, equipment certification, regular maintenance, and electrical worker certification, similar to PEC and OSHS.	Electrical Safety Regulation 1994; Electricity Supply Act 1990
Singapore	Electricity (Electrical Installations) Regulations; Workplace Safety and Health Act (WSHA)	Aligns closely with IEC standards; focuses on safe installation practices, equipment certification, PPE, and training requirements similar to OSHS and PEC.	Electricity (Electrical Installations) Regulations; WSHA
Thailand	Electrical Engineering Act B.E. 2542 (1999); Thai Industrial Standards (TIS) for Electrical Safety	Emphasizes training and certification of electrical workers, safe installation practices, and compliance with IEC standards, mirroring RA 7920 and OSHS.	Electrical Engineering Act B.E. 2542; TIS
Indonesia	National Standardization Agency of Indonesia (SNI) Standards; Minister of Energy and Mineral Resources Regulation	Requires compliance with safe installation practices, equipment standards, and certification of electrical workers, similar to the PEC and OSHS.	SNI Standards; Ministerial Regulations
Vietnam	National Technical Regulation on Electrical Safety; Circular No. 33/2015/TT-BCT	Aligns with IEC standards; mandates safe installation practices, equipment standards, and worker certification, similar to the PEC and OSHS.	Circular No. 33/2015/TT-BCT; National Technical Regulation
Cambodia	Law on Electricity of Cambodia; Technical Standards of Electricity Authority of Cambodia	Requires compliance with IEC standards, safe installation practices, and electrical worker certification, similar to the PEC and OSHS.	Law on Electricity; Technical Standards of EAC
Brunei	Electricity Act (Cap 71); Electrical Safety Regulations	Focuses on licensing and inspection, safe installation practices, and equipment certification, similar to the PEC and OSHS.	Electricity Act (Cap 71); Electrical Safety Regulations
Laos	Electricity Law (Amended 2012); Safety Standards for Electrical Installations	Based on IEC standards; emphasizes safe installation practices and electrical safety, similar to the PEC and OSHS.	Electricity Law; Safety Standards for Electrical Installations
Myanmar	Electricity Law (2014); National Electrical Safety Code	Aligns with international practices; focuses on safe installation, equipment safety, and worker training similar to the PEC and OSHS.	Electricity Law; National Electrical Safety Code

The table above outlines the electrical safety regulations in ASEAN member states that are similar to those in the Philippines, including specific regulatory references where applicable.

Table 10: ASEAN Environmental Regulations Similar to Philippine Standards

COUNTRY	ENVIRONMENTAL REGULATION	SIMILAR STANDARDS TO THE PHILIPPINES	REGULATORY REFERENCE
Philippines	Environmental Impact Assessment (EIA) under Presidential Decree No. 1586; Republic Act No. 8749 (Clean Air Act); Republic Act No. 9275 (Clean Water Act); Republic Act No. 9003 (Ecological Solid Waste Management Act); Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act)	Comprehensive environmental regulations covering EIA, air and water quality, waste management, and hazardous substances control.	PD 1586; RA 8749; RA 9275; RA 9003; RA 6969
Malaysia	Environmental Quality Act 1974; Environmental Impact Assessment Order 2015	Regulates emissions, air and water quality, waste management, and requires EIAs for significant projects, similar to the Philippines' environmental laws.	Environmental Quality Act 1974; EIA Order 2015
Singapore	Environmental Protection and Management Act (EPMA); Environmental Public Health Act (EPHA)	Robust regulations on air and water quality, waste management, hazardous substances, and mandatory EIAs, aligning with Philippine standards.	EPMA; EPHA
Thailand	Enhancement and Conservation of National Environmental Quality Act (NEQA)	Includes EIA requirements, regulates emissions, air and water quality, and waste management, similar to the Philippines' Clean Air Act and Clean Water Act.	NEQA
Indonesia	Environmental Protection and Management Act (Law No. 32 of 2009); Government Regulation No. 27 of 2012 on Environmental Permits	Requires EIAs, controls emissions and discharges, and regulates hazardous substances and waste, similar to Philippine environmental laws.	Law No. 32 of 2009; Government Regulation No. 27 of 2012
Vietnam	Law on Environmental Protection 2020; Decree No. 40/2019/ND-CP on Amendments and Supplements to Environmental Protection Law Provisions	Mandates EIAs, regulates emissions and waste management, and sets standards for air and water quality, aligning with Philippine environmental regulations.	Law on Environmental Protection 2020; Decree No. 40/2019/ND-CP
Cambodia	Law on Environmental Protection and Natural Resource Management 1996; Sub-Decree on Environmental Impact Assessment Process	Requires EIAs, regulates emissions, waste management, and hazardous substances control, similar to the Philippines' environmental protection laws.	Law on Environmental Protection 1996; Sub-Decree on EIA Process

COUNTRY	ENVIRONMENTAL REGULATION	SIMILAR STANDARDS TO THE PHILIPPINES	REGULATORY REFERENCE
Brunei	Environmental Protection and Management Order 2016; Environmental Protection and Management (Amendment) Order 2021	Focuses on EIAs, emissions control, waste management, and hazardous substances regulation, similar to Philippine standards.	Environmental Protection and Management Order 2016; Amendment Order 2021
Laos	Law on Environmental Protection (Amended 2012); Decree on Environmental Impact Assessment No. 112/PM	Includes EIA requirements, controls emissions, and regulates waste and hazardous substances, aligning with the Philippines' environmental framework.	Law on Environmental Protection (Amended 2012); Decree No. 112/PM
Myanmar	Environmental Conservation Law 2012; Environmental Impact Assessment Procedure 2015	Mandates EIAs, regulates emissions and waste management, and controls hazardous substances, similar to the Philippines' environmental regulations.	Environmental Conservation Law 2012; EIA Procedure 2015

This table provides a comprehensive comparison of environmental regulations in ASEAN member states that are similar to those in the Philippines, including specific regulatory references where applicable.

AREAS FOR HARMONIZATION AND IMPROVEMENT

While there are many commonalities in regulations across ASEAN countries, there are also areas where further harmonization and improvement can enhance regional cooperation and safety standards.

Standardization of Electrical Codes: Although ASEAN countries adopt international standards, the implementation details and specific requirements can vary. Harmonizing these standards by creating a unified ASEAN Electrical Code could streamline regulatory processes, reduce compliance costs, and facilitate cross-border electrical engineering projects.

Mutual Recognition of Certifications: Establishing mutual recognition agreements for professional licenses and certifications can significantly enhance the mobility of electrical engineers and workers across ASEAN member states. This would promote knowledge exchange, best practices, and innovation, contributing to higher safety and quality standards throughout the region.

Enhanced Data Sharing and Collaboration: Creating a centralized database for sharing information on electrical safety incidents, environmental impacts, and best practices could help ASEAN countries learn from each other's experiences. This would support continuous improvement in regulatory frameworks and enforcement practices, ultimately leading to safer and more sustainable electrical engineering practices.

Uniform Environmental Standards: While many ASEAN countries have comprehensive environmental regulations, there is room for harmonization in areas such as waste management, air and water quality standards, and emissions controls. Developing uniform environmental standards across the region would ensure consistent environmental

To promote regional integration and sustainable development, there is a growing need to address critical areas in electrical safety and environmental regulations across ASEAN member states. ASEAN countries can improve safety standards, streamline processes, and foster mutual cooperation by enhancing consistency and collaboration in these areas. Key focus areas include aligning electrical codes with international standards, mutual recognition of professional certifications, improved data sharing, and harmonizing environmental regulations. These initiatives are vital for ensuring the region's safer and more environmentally responsible future.

1. **Standardization of Electrical Codes:** Developing a unified ASEAN Electrical Code aligned with international standards (IEC and NEC) to streamline regulatory processes and ensure consistent safety practices across the region.
2. **Mutual Recognition of Certifications:** Establishing agreements for the mutual recognition of professional licenses and certifications for electrical engineers and workers across ASEAN countries.
3. **Enhanced Data Sharing and Collaboration:** Creating a centralized database for sharing information on electrical safety incidents, best practices, and environmental impacts among ASEAN countries.
4. **Uniform Environmental Standards:** Harmonizing environmental regulations, including waste management practices, air and water quality standards, and emissions controls, across ASEAN member states.

SECTION

8

**ENVIRONMENTAL
REGULATIONS**

SECTION 8: ENVIRONMENTAL REGULATIONS

In the Philippines, electrical installation and construction projects must adhere to several environmental regulations that govern their impact on the environment. These regulations are in line with national laws, international standards, and best practices.

These regulations ensure that electrical installation and construction projects in the Philippines are designed and implemented in a manner that minimizes their negative environmental impact while promoting sustainability. Compliance with these laws is essential for project approval and the issuance of necessary permits and certificates.

Environmental Impact Assessment (EIA) and Environmental Compliance Certificate (ECC) Presidential Decree No. 1586 (Philippine Environmental Impact Statement System): Electrical engineering projects must undergo an Environmental Impact Assessment (EIA) to evaluate potential environmental effects. Projects likely to have a significant environmental impact require an Environmental Compliance Certificate (ECC) issued by the Department of Environment and Natural Resources (DENR). This applies to the construction of power plants, substations, transmission lines, and other large-scale electrical installations.

Republic Act No. 8749 (Clean Air Act of 1999) Projects involving generators, power plants, or other electrical systems that contribute to air emissions are regulated under this law. The Clean Air Act requires strict compliance with emissions standards and the use of best available control technologies to minimize air pollution.

Republic Act No. 9275 (Clean Water Act of 2004) Projects that involve power generation, cooling systems, or electrical installations near water bodies must comply with water quality standards. Effluents from these installations are monitored to prevent the contamination of water resources.

Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000) Waste generated from electrical engineering projects, particularly hazardous wastes like batteries, cables, and electronic components, must be managed according to this law. Waste minimization, recycling, and proper disposal are mandated, particularly in industrial projects.

Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990) Projects dealing with hazardous materials, such as those involving transformers, electrical insulators, and batteries, must comply with this law. It requires proper handling, storage, and disposal of hazardous substances and mandates an inventory of hazardous materials.

Republic Act No. 9513 (Renewable Energy Act of 2008) Encourages the use of renewable energy sources in electrical engineering projects, such as solar, wind, and hydropower, to reduce reliance on fossil fuels and mitigate environmental impacts. This law provides incentives for developing environmentally friendly energy projects.

DENR Administrative Orders DAO 2003-30: Guidelines for the Issuance of ECC and for compliance with the Philippine EIS System and **DAO 2013-22:** Covers the specific requirements for addressing environmental impacts related to electrical projects, including guidelines on waste management, air quality, and resource use.

Building Codes and Energy Efficiency Standards

- Electrical engineering projects must comply with the **Philippine Green Building Code known as PD1565**, which encourages the adoption of sustainable building practices and promotes energy-efficient design.
- The **Energy Efficiency and Conservation Act (Republic Act No. 11285)** provides guidelines for the adoption of energy-efficient technologies. and the promotion of renewable energy systems in construction projects.
- **The Philippine Green Building Code**, officially known as Presidential Decree No. 1565 was established in 2017 to complement the NBC. It specifically addresses environmental concerns related to building construction and operation. The PGBC encourages the adoption of sustainable building practices and aims to reduce the environmental impact of buildings throughout their lifecycle.

Local Government Regulations

- Some local government units (LGUs) have additional ordinances that regulate the environmental impact of electrical engineering projects, including zoning laws, waste disposal regulations, and noise ordinances.

SECTION

9

TECHNOLOGY AND INNOVATION

SECTION 9: TRENDS AND TECHNOLOGIES

Technology and Innovation is an essential process of change that is necessary to maintain the development and growth of the society. Innovation is defined as the ability of an enterprises to creatively in response to market-articulated demand and/or other social needs. Innovation plays a pivotal role in economic progress by increasing enterprise competitiveness in the global marketplace.

New scientific and technological advances have created evolutions in innovation processes, and technology is a primary enabler of innovations in enterprises. While market demand orients the market, it requires the integration of research with manufacturing, technology with production, and both research and technology with customers and suppliers.

As technology and innovation are vital drivers of economic progress and societal development, it is crucial for governments to create supportive frameworks that nurture and sustain these advancements. Several Republic Acts have been enacted in the Philippines to foster an environment conducive to technological and scientific growth. These laws provide the necessary infrastructure, funding, and incentives to support innovation and research across various sectors. By examining these legislative measures, we can gain insight into how the Philippine government is actively promoting technology and innovation to enhance the nation's competitiveness and address pressing social needs.

Table 13. Republic Acts in the Philippines Relevant to Technology and Innovation

REPUBLIC ACT NUMBER	SUMMARY
Republic Act No. 11293	Known as the 'Innovative Startup Act' (2019), this law aims to foster the growth and development of startups by providing financial support, incentives, and streamlined regulatory processes. It also establishes the Startup Grant Fund to support innovative projects.
Republic Act No. 1606	Enacted in 1978, this law is the 'Invention and Development Act.' It promotes scientific, engineering, and technological research by providing incentives and financial support to inventors and researchers.
Republic Act No. 2067 (amended by R.A. No. 3589)	Known as the 'Science Act of 1958,' this law integrates and enhances scientific and technological research through the creation of the National Science Development Board (NSDB), with funds allocated to support research activities.
Republic Act No. 6959	The 'Provincial Centers for Science and Technology Act' (1990) establishes science and technology centers in every province to promote local development and technology access.
Republic Act No. 8439	The 'Magna Carta for Scientists, Engineers, Researchers, and other Science and Technology Personnel in Government' (1998) aims to improve the welfare of S&T personnel through incentives such as higher salaries and research allowances.

PHILIPPINE ELECTRICITY MARKET

Electric Power Industry Reform Act (EPIRA)

In 2001, the Philippine government enacted the Electric Power Industry Reform Act (EPIRA) to address high electricity prices and inefficiencies within the sector. This landmark legislation aimed to transform the electricity market by fostering competition, privatizing the state-owned National Power Corporation (NPC), and establishing new regulatory bodies.

EPIRA shifted the market from government control to a competitive environment, allowing multiple power producers and retailers to participate. The privatization of NPC's generation and transmission assets reduced direct government involvement and encouraged private investment. The Energy Regulatory Commission (ERC) was created to oversee market competition, regulate prices, and enforce the new rules. Additionally, EPIRA led to the establishment of the Wholesale Electricity Spot Market (WESM) in 2006, introducing a competitive platform for trading electricity.

Wholesale Electricity Spot Market (WESM)

The Philippines' electricity market has undergone significant transformation over the past two decades, with notable advancements aimed at fostering competition and transparency. A key milestone in this evolution was the introduction of the Wholesale Electricity Spot Market (WESM) in 2006. This market shift marked a departure from a traditionally monopolistic structure, steering the sector towards a more competitive and transparent model.

WESM serves as the critical platform where electricity buyers, such as distribution utilities and retail electricity suppliers, interact with sellers, primarily power generators. The market facilitates real-time electricity trading, with prices determined by market forces through hourly bids reflecting the dynamic balance between supply and demand. This mechanism not only enhances competition but also plays a crucial role in price discovery, especially during periods of fluctuating demand.

The market initially operated in Luzon and Visayas, but its scope expanded with the inclusion of Mindanao in 2017, thereby broadening its reach across the country. WESM is instrumental in maintaining grid reliability, allowing participants to adjust their electricity supplies based on real-time conditions.

Notably, among all ASEAN countries, the Philippines and Singapore are the only nations with such a comprehensive and sophisticated electricity market structure. Like the Philippines, Singapore's market emphasizes competitive trading and transparency but operates on a different scale and regulatory framework.

TRENDS IN THE ELECTRICAL INDUSTRY IN THE PHILIPPINES

Net Metering This allows consumers to generate their own electricity, often through solar panels, and receive credits for excess energy fed back into the grid. This system, regulated by the Renewable Energy Act of 2008, is overseen by the Department of Energy (DOE) and the Energy Regulatory Commission (ERC). It provides financial benefits by reducing electricity bills and encourages the use of renewable energy. Several distribution utilities across the Philippines have implemented net metering programs. Notable examples include Meralco, the most extensive distribution utility in Metro Manila and surrounding areas, and Visayan Electric Company (VECO) in the Visayas region. Other utilities like Davao Light and Power Company and Cagayan Electric Power and Light Company (CEPALCO) are also actively involved in facilitating net metering for their customers.

Prepaid Electricity Systems Prepaid Electricity Systems are revolutionizing how energy is managed by allowing consumers to buy electricity credits in advance. This approach provides users with better control over their energy expenses and avoids unexpectedly high bills. Distribution utilities such as Meralco and VECO have implemented these systems, offering various payment channels, including online platforms and local vendors. The convenience and flexibility of prepaid systems enhance the consumer experience, allowing them to manage their energy use more effectively.

Smart Grids This represents a significant advancement in energy management, utilizing technologies like real-time monitoring and automated control systems to improve grid efficiency and reliability. The DOE and ERC are crucial in setting the regulatory framework and guidelines for smart grid development. Utilities such as Meralco and other regional providers are integrating smart grid technologies to enhance operational efficiency and support the seamless incorporation of renewable energy sources. Despite the high investment required, smart grids offer substantial benefits in terms of grid stability and energy management.

Renewable Energy Integration Renewable Energy Integration is a major trend, with the Renewable Energy Act of 2008 providing the legal framework for increasing the use of renewable sources like solar, wind, and hydropower. The DOE and ERC play key roles in promoting and regulating renewable energy projects across the Philippines. Utilities such as the Philippine National Oil Company (PNOC) and the National Power Corporation (NPC) are involved in large-scale renewable energy projects. The focus on renewable energy contributes to reduced greenhouse gas emissions and enhanced energy security, aligning with the country's goals for a sustainable energy future.

Time-of-Use (TOU) Pricing This is a strategy to manage electricity demand by offering different rates at various times of the day. This method encourages consumers to shift their energy use to off-peak hours, helping to balance grid load and promote conservation. The ERC sets the guidelines for TOU pricing, and distribution utilities implement these structures. Utilities like Meralco are among those adopting TOU pricing better to manage energy consumption patterns and support grid stability.

SCADA (Supervisory Control and Data Acquisition) These are now widely used across the Philippines to manage complex infrastructure and utility operations. SCADA allows for real-time monitoring and control of electrical grids and other critical systems like water distribution and transportation. This technology is crucial for utilities and industrial facilities in the Philippines, enabling remote monitoring, automated processes, and quick response to system issues. For example, energy providers like the National Grid Corporation of the Philippines (NGCP) rely on SCADA to ensure the stability and reliability of the country's electrical grid. SCADA's role is essential in managing the country's growing energy demands and ensuring operational efficiency.

Building Management Systems (BMS) Building Management Systems (BMS) are being implemented to optimize energy consumption and building operations. BMS control key systems such as heating, ventilation, air conditioning (HVAC), lighting, and security. They help enhance energy efficiency, improve occupant comfort, and reduce operational costs. Commercial complexes, shopping malls, office buildings, and residential condominiums across Metro Manila and other urban centers are increasingly adopting BMS technology. This system allows building operators to monitor and manage energy use in real time, contributing to the country's push for more sustainable building practices.

SECTION

10

**PROFESSIONAL
NETWORKING
AND
ASSOCIATIONS**

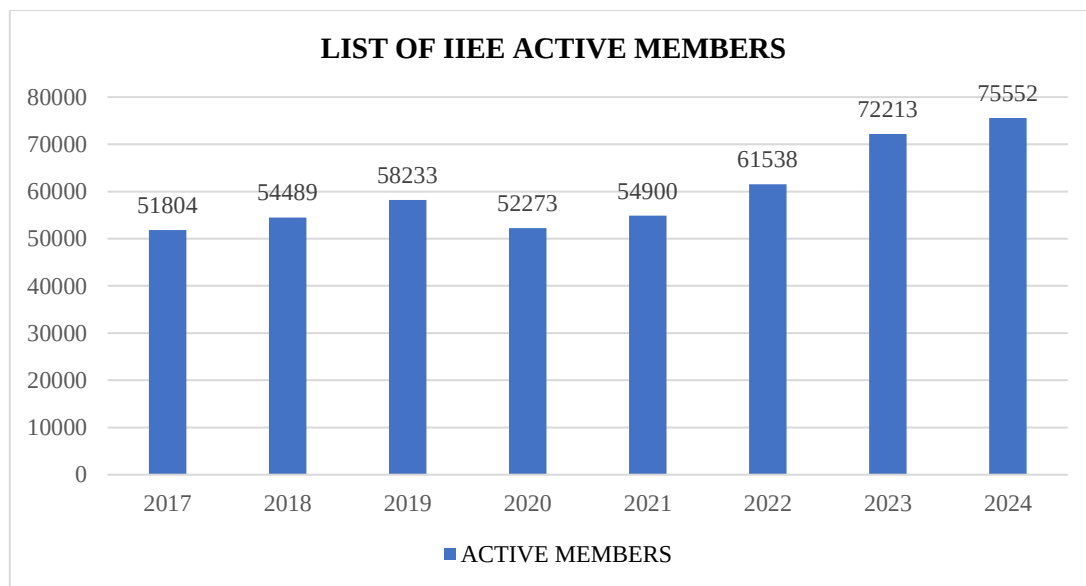
SECTION 10: PROFESSIONAL NETWORKING AND ASSOCIATIONS (PHILIPPINES)

Within the ever-evolving domain of electrical engineering, professional networking and organizations are instrumental in promoting collaboration, facilitating the exchange of knowledge, and advancing career progression. In the context of the Philippines, numerous associations function as essential venues for electrical professionals, offering avenues for professional enhancement, advocacy efforts, and ongoing educational pursuits. These groups and organizations offer a varied range of materials, such as technical seminars and workshops, plus an industry base of standards and certification, that are essential to ensure professional practice is at its most excellent in electrical engineering.

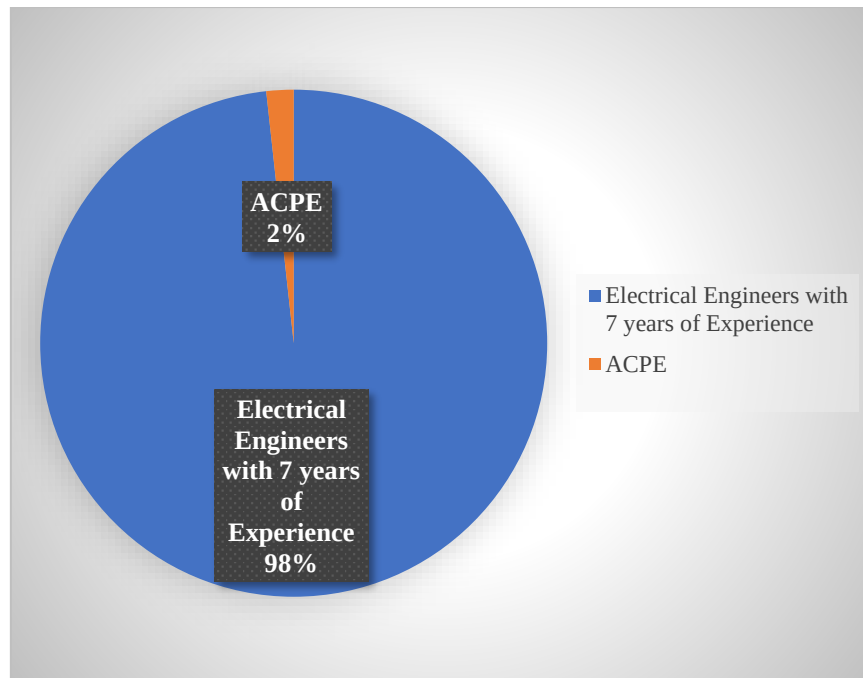
ELECTRICAL ENGINEERING-RELATED ORGANIZATIONS

Institute of Integrated Electrical Engineers of the Philippines (Inc.) (IIEE)

The Institute of Integrated Electrical Engineers of the Philippines, Inc. (IIEE) is dedicated to supporting electrical practitioners and is the sole accredited professional organization recognized by the Professional Regulation Commission (PRC). Established in 1975 with a modest membership, IIEE now serves over 75,000 members and aims to significantly expand. Its mission is to enhance professional credentials through CPD programs, uphold high standards of integrity, advance technological knowledge, and foster regular interaction among its members.



As of 2024, out of the 75,552 active IIEE members, approximately **32,000** Registered Electrical Engineers have seven or more years of professional experience in the field, making them potential candidates for the ASEAN Chartered Professional Engineer (ACPE) designation. Currently, **564** of these engineers have already attained ACPE status.



Society of Philippine Electrotechnical Constructors and Suppliers Inc. (SPECS)

The Society of Philippine Electrotechnical Constructors and Suppliers Inc. (SPECS) is a non-stock, non-profit organization accredited by the Philippine Contractors Accreditation Board (PCAB), representing licensed electrotechnical constructors and suppliers. Its mission is to unify its members, addressing the needs of the electrical industry and contributing to regional development within ASEAN. The organization's website highlights its purpose and the people driving its dynamic efforts to advance the industry and serve its members effectively.

Philippine Association of Master Electricians Inc. (PAME) established in July 2015, was formed to defend and protect the profession of Registered Master Electricians from unjust treatment. It emerged in response to legislative efforts aimed at downgrading Registered Master Electricians to Registered Industrial Electricians or Registered Line Electricians, as proposed by the Institute of Integrated Electrical Engineers of the Philippines. PAME Inc. serves as a collective advocate for Registered Master Electricians, emphasizing their rights and fostering a sense of brotherhood within the profession.

The United Professional Electrical Engineers of the Philippines (UPEEP) established in 2018, is a distinguished group of Professional Electrical Engineers (PEE) committed to providing electrical practitioners with high-quality training, seminars, and technical forums. Their goal is to enhance the skills and knowledge of professionals in the field, ensuring they stay at the forefront of industry developments.

Association of City and Municipal Electrical Engineers and Electricians (ACMEEEE) is an organization representing electrical engineers and electricians working at the city and municipal levels. Its purpose is to provide a platform for members to collaborate, share knowledge, and address common challenges faced in local electrical engineering and electrical work. The association also focuses on promoting professional development, upholding industry standards, and advocating for the needs and interests of electrical practitioners in various municipalities.

The Philippine Rural Electric Cooperatives Association, Inc. (PHILRECA) is the national organization representing electric cooperatives and allied organizations across the country. For over forty years, PHILRECA has championed rural electrification while enhancing the quality,

reliability, and global competitiveness of electric cooperatives. The association supports its members through policy advocacy, government representation, capacity-building initiatives, and by fostering strong relationships with energy stakeholders, all while adapting to new industry developments and challenges.

Renewable Energy Association of the Philippines (REAP), established in 1985, is a non-stock, non-profit organization dedicated to advancing, promoting, and commercializing renewable energy technologies for sustainable energy generation. Its mission is to offer a platform for private sector leaders to share ideas, expertise, and views on renewable energy systems while fostering unity and cooperation within the industry. REAP envisions itself as the leading organization addressing critical issues in national development through renewable energy initiatives.

SECTION

11

LEGAL AND ETHICAL CONSIDERATIONS

SECTION 11: LEGAL AND ETHICAL CONSIDERATIONS

This section explores the critical ethical standards set forth by key code of ethics, which guide electrical engineers in their practice. By upholding principles of honesty, fairness, and responsibility, engineers ensure their work enhances public welfare and professional credibility. Understanding and implementing these ethical guidelines are fundamental to navigating the complexities and responsibilities of the engineering profession.

Republic Act 6713 is an act establishing a code of conduct and ethical standards for public officials and employees, to uphold the time-honored principle of public office being a public trust, granting incentives and rewards for exemplary service, enumerating prohibited acts and transactions and providing penalties for violations thereof and for other purposes.

BOARD OF ELECTRICAL ENGINEERING – CODE OF ETHICS

The **Code of Ethics** for Electrical Engineers, adopted by the Board of Electrical Engineering, is grounded in Republic Act No. 184 and P.D. 223. It sets standards for professional conduct, emphasizing integrity, fairness, and public interest.

1. **Article I: Professional Life**

- Ensures duty to clients and employers is executed with fairness and integrity.
- Promotes continuous skill enhancement and ethical advertising.
- Emphasizes safety, accurate opinions, and responsible communication.

2. **Article II: Relation with Client and Employer**

- Mandates fairness in service and conflict-of-interest disclosures.
- Requires confidentiality and clear presentation of work limitations.
- Prohibits multiple compensations for the same service and financial interest in competitive bids without consent.

3. **Article III: Relations with Fellow Engineers**

- Protects the profession from misrepresentation and unfair criticism.
- Advocates for proper credit attribution and adherence to professional standards.
- Discourages damaging fellow engineers' reputations and unethical competition practices.

4. **Article IV: Penal Provisions**

- Defines violations as unethical and subject to disciplinary action by the Board.

INSTITUTE OF INTEGRATED ELECTRICAL ENGINEERS OF THE PHILIPPINES INC. (IIEE) - CODE OF ETHICS

IIEE Code of Ethics establishes standards for the conduct of members of the Institute of Integrated Electrical Engineers of the Philippines, Inc. (IIEE). It aims to uphold the integrity, honor, and dignity of the engineering profession.

1. Foreword

- Members are committed to using their skills for human welfare, maintaining honesty and impartiality, and enhancing the profession's competence and prestige.

2. Fundamental Canons

- **Responsibility:** Ensure safety and disclose potential risks.
- **Conflict of Interest:** Avoid or disclose conflicts.
- **Honesty:** Provide accurate and realistic claims.
- **Anti-Corruption:** Reject all forms of graft and corruption.
- **Competence:** Continuously improve technical skills.
- **Disclosure:** Be transparent about limitations.
- **Constructive Criticism:** Accept and offer feedback, acknowledge errors, and give proper credit.
- **Equal Treatment:** Treat all individuals fairly.
- **Protection:** Avoid actions that harm others' reputation or livelihood.
- **Transparency:** Avoid spreading false or misleading information.
- **Support:** Assist colleagues in professional development and adherence to the Code.
- **Compliance:** Fulfill all professional obligations.
- **Fair Competition:** Engage in fair and honest practices.

LIST OF REFERENCES

1. **Occupational Safety and Health Administration (OSHA).** "OSH Standards Related to Electrical Engineering." OSHA 29 CFR 1910 Subpart S (Electrical), OSHA 29 CFR 1910.331-335 (Electrical Safety-Related Work Practices).
2. **Philippine Electrical Code.** "OSH Standards Related to Electrical Engineering."
3. **Environmental Regulations Related to Electrical Engineering in the Philippines.** "Environmental Impact Assessment (EIA) and Environmental Compliance Certificate (ECC)." Presidential Decree No. 1586.
4. **Republic of the Philippines.** "Republic Act No. 8749: Clean Air Act of 1999." Official Gazette, 1999.
5. **Republic of the Philippines.** "Republic Act No. 9275: Clean Water Act of 2004." Official Gazette, 2004.
6. **Republic of the Philippines.** "Republic Act No. 9003: Ecological Solid Waste Management Act of 2000." Official Gazette, 2000.
7. **Republic of the Philippines.** "Republic Act No. 6969: Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990." Official Gazette, 1990.
8. **Republic of the Philippines.** "Republic Act No. 9513: Renewable Energy Act of 2008." Official Gazette, 2008.
9. **Department of Environment and Natural Resources (DENR).** "Environmental Impact Assessment (EIA) System in the Philippines." DENR Administrative Order No. 30, Series of 2003.
10. **Ministry of Environment and Water, Malaysia.** "Environmental Quality Act 1974." Laws of Malaysia Act 127, 1974.
11. **National Environment Agency, Singapore.** "Environmental Protection and Management Act (EPMA)." Statutes of Singapore, Chapter 94A.
12. **Ministry of Natural Resources and Environment, Vietnam.** "Law on Environmental Protection 2020." Vietnam Government Portal, 2020.
13. **Department of Energy (DOE), Thailand.** "Electrical Engineering Act B.E. 2542 (1999)." Thailand Government Gazette, 1999.
14. **National Assembly of Laos.** "Law on Environmental Protection (Amended 2012)." Lao Official Gazette, 2012.
15. **National Assembly of Cambodia.** "Law on Environmental Protection and Natural Resource Management 1996." Royal Government of Cambodia, 1996.
16. **Ministry of Industry and Trade, Vietnam.** "Circular No. 33/2015/TT-BCT: National Technical Regulation on Electrical Safety." Vietnam Government Portal, 2015.
17. **Ministry of Energy and Mineral Resources, Indonesia.** "Law No. 32 of 2009 on Environmental Protection and Management." Indonesia Government Official Gazette, 2009.
18. **Electricity Authority of Cambodia.** "Technical Standards of Electricity Authority of Cambodia." EAC Publications, 2019.
19. **National Energy Administration, Myanmar.** "Electricity Law 2014." Myanmar Government Portal, 2014.
20. **Brunei Darussalam.** "Environmental Protection and Management Order 2016." Brunei Government Gazette, 2016.
21. **National Standardization Agency of Indonesia (SNI).** "Standards on Electrical Safety." SNI Publications, 2010.
22. **Ministry of Energy, Brunei.** "Electricity Act (Cap 71)." Brunei Government Gazette, 1984.
23. **Laos Ministry of Energy and Mines.** "Safety Standards for Electrical Installations." Lao PDR Government Gazette, 2013.
24. **Department of Labor and Employment (DOLE), Philippines.** "Occupational Safety and Health Standards (OSHS)." DOLE Publications, 2000.

ANNEX A

ASEAN Electrical Engineering Information Exchange Template

Abstract:

This comprehensive template aims to provide a structured and consistent approach to information exchange, supporting the professional mobility and collaboration of electrical engineers across ASEAN. It includes specific details for the Philippines, serving as a model for other ASEAN countries to adapt and expand upon.

Instructions for Use:

1. Data Collection:

- Gather the required information from relevant authorities and organizations in each ASEAN member state.

2. Template Customization:

- Modify the template as necessary to fit specific national or regional requirements.

3. Regular Updates:

- Ensure the information is regularly reviewed and updated to reflect any changes in laws, standards, or practices.

4. Distribution:

- Share the completed templates with relevant stakeholders, including educational institutions, licensing authorities, engineering firms, and professional associations.

5. Inter-country Collaboration:

- Mechanisms for fostering collaboration between electrical engineers in different ASEAN countries.
- Joint projects and exchange programs.

6. Feedback and Improvements:

- Procedures for collecting feedback from users of the template.
- Continuous improvement processes to keep the template relevant and up-to-date.

Section 1: Education (Philippines)

1. Educational Institutions:

2. Curriculum Overview:

3. Continuing Education:

Section 2: Licensure and Regulatory Laws (Philippines)

1. Licensing Authorities:

2. Licensure Requirements:

3. Regulatory Laws:

Section 3: Codes and Standards Utilization (Philippines)

1. International Standards:
2. National Standards:
3. Implementation and Compliance:

Section 4: Local Laws on Permits (Philippines)

1. Permit Requirements:
2. Authority Contacts:
3. Compliance and Inspections:

Section 5: Nominal Voltages (Philippines)

1. Generation:
2. Transmission:
3. Distribution:
4. Residential:
5. Industrial and Commercial:
6. Other Sectors:

Section 6: MRAs Compliance

1. Mutual Recognition Agreements/Arrangements:
2. Harmonization Efforts:

Section 7: Safety Standards and Practices (Philippines)

1. Occupational Safety and Health:
2. Incident Reporting:

Section 8: Environmental Regulations (Philippines)

1. Environmental Impact:

2. Sustainable Practices:

Section 9: Technology and Innovation

1. Emerging Technologies:
2. Research and Development:

Section 10: Professional Networking and Associations (Philippines)

1. Professional Associations:
2. Networking Opportunities:

Section 11: Case Studies and Best Practices

1. Successful Projects:
2. Innovative Solutions:

Section 12: Legal and Ethical Considerations (Philippines)

1. Legal Framework:
2. Ethical Dilemmas:

Section 13: Support and Resources

1. Technical Support:
2. Educational Resources: