International evaluation and accreditation

EVALUATION AND ACCREDITATION DOCUMENTS

Ph.D. Electronic and Electrical Engineering

Africa Centre of Excellence for ICT-Driven Knowledge Park (ACE OAK-Park)

Obafemi Awolowo University

Ife-Ife, Nigeria

June 2024

Rapport publié le 12/07/2024

CONTENTS

International evaluation and accreditation

EVALUATION REPORT

Ph.D. Electronic and Electrical Engineering

Africa Centre of Excellence for ICT-Driven Knowledge Park (ACE OAK-Park)

Obafemi Awolowo University

Ile-Ife, Nigeria

March 2024

The Obafemi Awolowo University has mandated the Hcéres to perform the evaluation of its Electronic and Electrical Engineering Ph.D. programme. The evaluation is based on the "External Evaluation Standards" of foreign study programmes, adopted by the Hcéres Board on 31st January 2022. These standards are available on the Hcéres website (hceres.fr).

On behalf of the experts committee[1] :

Olivier Boutin, President of the committee

In the name of Hcéres[1] :

Stéphane Le Bouler, Acting President

[1]In accordance with articles R. 114-15 and R. 114-10 of the Research Code, evaluation reports are signed by the chair of the experts committee and countersigned by the President of Hcéres.

CONTENTS

I. STUDY PROGRAMME IDENTITY SHEET

- University: Obafemi Awolowo University, Ile-Ife, Nigeria
- Department concerned: Department of Electronic and Electrical Engineering, Faculty of Technology
- Title of the programme: Ph.D. Electronic and Electrical Engineering
- Year of creation and context: the Department of Electronic and Electrical Engineering was created on the 1st of October in 1972 with the Faculty of Technology of the Obafemi Awolowo University. The Faculty was established to cover the areas of technology neglected by other Nigerian Universities offering courses in the field of Engineering or Technology. The Federal Government through Decree No. 23 of 1975 took over the control of the University in 1975 and thus became the sole owner of the University. This programme is part of the ACE Impact Project launched in 2018 by the World Bank and the French Development Agency (AFD) following the successful implementation of ACE I and II.
- Site where the programme is taught (town and campus): main campus, Ile-Ife, Osun State, Nigeria

PROGRAMME DIRECTOR

- Surname, first name: Ilori, Olusoji
- Profession and grade: Senior Lecturer
- Main subject taught: Technology and Fabrication of Semiconductor Devices, and Technology and Fabrication of Passive Electronics

METHODS AND RESULTS OF THE PREVIOUS ACCREDITATION(S)

- In 2022, the programme was evaluated by the National Universities Commission (NUC). The programme has received its full accreditation by the NUC for 5 years, from March 2022 to March 2027.
- No previous international accreditation. The M.Sc. Electronic and Electrical Engineering is also being evaluated by Hcéres in 2023.

HUMAN AND MATERIAL RESOURCES DEDICATED TO THE PROGRAMME

- **Human resources**

Academic staff	Professors	Assistant Professors	Lecturers	Readers	Total
	8	**4**	**4**	**3**	**19**
Technical staff	Senior Technologists	Assistant Chief Technologist	Technologists	Engineers	Total
	2	**2**	**1**	**2**	**7**
Administrative staff	Principal Confidential Secretary	Senior Secretarial Assistant	Chief Library Officer	Others	Total
	1	**1**	**1**	**2**	**5**

- **Material resources:** computer labs and workstations, three seminar rooms, seven postgraduate classrooms, laboratories (microwave communication, semiconductor clean room, high voltage, electrical machines, control and instrumentation, artificial intelligence), workshops (mechanical, electrical, Printed Circuit Board (PCB) Assembly). Many analogue and numerical electronic training systems can be used by the students. The Obafemi Awolowo Library provides access to at least seven commercial databases, and the selection of open databases is diverse. The access to thesis (hard and softcopy), various scholar works and an antiplagiarism software are also provided by the library. A building dedicated to the Department of Electronic and Electrical Engineering is currently under construction.

STUDENT POPULATION: EVOLUTION AND TYPOLOGY OVER THE LAST 4 YEARS

		2019/2020	2020/2021*	2021/2022	2022/2023*
Enrolment	Male	25	-	23	-
	Female	5	-	2	-
	Total	**30**	**-**	**25**	**-**
	including foreigners	*2*	-	2	-
Graduates	Male	20	-	5	-
	Female	4	-	0	-
	Total	**24**	**-**	**5**	**-**
	including foreigners	*0*	-	*0*	-

**Due to the Covid-19 pandemic and industrial action embarked by Academic staff of Nigerian universities, Ahmadu Bello University had to cancel two academic sessions (2020-2021 and 2022-2023). No admissions were possible during these specified periods.*

II. PRESENTATION OF THE STUDY PROGRAMME

1 – PRESENTATION OF THE STUDY PROGRAMME

The ACE ICT OAK PARK is an Africa Centre of Excellence hosted by Obafemi Awolowo University, Nigeria, established as part of the ACE Impact, a World Bank-supported project in 2018. The Centre was initiated to improve engineering education through the experimentation of new teaching methodologies, curriculum development, and the application of these findings to future engineering education, in order to enable engineers to address 21st-century challenges in a creative and responsible manner. Therefore, its stated mission is to provide a world-class teaching and learning environment to promote innovation in techno-pedagogical skills and competencies for engineering education and practice.

The economic and sustainable development of Nigeria requires mastering communication technology and electric power production. The students who graduate from this doctoral programme are expected to be among the leaders in the areas of electronic and electrical engineering in universities, national agencies, and industries. The research they have conducted should address societal and industrial issues through innovation, proof of concepts and field implementation. The hard and soft skills acquired during their academic curriculum should enable them to apply rigorous methods to design, develop, and implement solutions to produce sustainable, affordable, and reliable electricity or master electronic materials and components for telecommunication. Therefore, the programme proposes core and advanced courses, such as Innovation in Networking, Smart Grids, Technology of Semiconductor Materials and Discrete Data Systems, which support the four specialisations in Power Systems, Communications, Control and Instrumentation, and Materials and Devices.

2 – PRESENTATION OF THE PROGRAMME'S SELF-EVALUATION APPROACH

The Faculty of Technology has a committee on quality assurance which comprises one member from each of the departments. This member is the quality assurance officer of the Department and Chairman of the Departmental quality assurance committee, comprising three members. The first submitted self-evaluation report provided few information on the research units and inconsistent data regarding the number of PhD students. The additional documents (handbook, table of students) requested during the interviews were provided within the week.

III. COMPOSITION OF THE EXPERTS PANEL

- **Olivier BOUTIN**, Chair of the panel, Full professor, Aix-Marseille University, France
- **Ali DAOUADJI**, Full professor, INSA Lyon, France
- **Demba DIALLO**, Full professor, Paris-Saclay University, France
- **Maxime LEBRETON**, Ph.D. Student, ENS-PSL Paris, France

Hcéres was represented by **Zakia MESTARI**, project manager, Europe and International Department.

IV. VISIT DESCRIPTION

- **Date of the visit:** the visit took place on Wednesday 6th December 2023.
- **Summary of the proceedings:** before the visit, the self-evaluation report and a few appendices were received by the experts. Two preparatory meetings between the Director of the Hcéres Europe and International Department, the project manager and the panel of experts were held in Paris (13th November) and online (29th November). The on-site visit took place over one day, according to a schedule agreed upon between the ACE ICT OAK PARK, NUC, and the panel. During the visit, the experts required more documents with quantitative data. They were available on 11th December.
- **Organisation of the visit:** for security reasons, the panel could not visit the Centre in Ife-Ile. The visit was organised in hybrid mode in Abuja. The Centre leaders, programme director, postgraduate coordinator and several staff members and students of the Obafemi Awolowo University met the panel in Abuja.
- **Cooperation of study programme and institution to be accredited:** ACE ICT OAK PARK has been cooperative throughout the process. The questions asked during the visit were answered. The panel is satisfied with the conclusion, which is based on available and relevant information. Moreover, the involvement of the National Universities Commission has been constructive.
- **People met:** the experts' committee was able to meet with 26 people from different panels:

	Session	Audience
8:00 – 9:30	Presentation of the programme and discussion	Centre Leaders, programmes directors and their teams
9:30 – 10:30	Academic staff	Representative panel of academics from both programmes
10:45 – 11:45	Quality assurance	Quality assurance representatives
11:45 – 12:45	Alumni	Representative panel of alumni
14:00 – 15:00	Socio-economic partners and employers	Representative panel of socio-economic partners and employers
15:00 – 16:30	Students	Representative panel of students from both programmes
16:30 – 17:30	Closing session	Centre Leaders, programmes directors and their teams

V. EVALUATION REPORT

1 – DOCTORAL POLICY

The doctoral programme in Electronic and Electrical Engineering offers specialisation in light current (electronic) and heavy current (electrical power) divided in four specialised areas: Power Systems, Communications, Control and Instrumentation, and Materials and Devices. The research topics and course works are supported by four research units, each one associated to a specialised area. It should be noted that most students start their doctoral studies several years after obtaining their Master's degree. Therefore, they often had quite a few professional experiences (academic, industrial or in agencies or institutes).

The doctoral policy is consistent with the scientific and strategic orientations of the institution, which are aligned with the national agenda, specifically the priority of advancing electrification for industrial and economic development. The programme's structure, based on latest developments and modern technologies, emphasises not only theoretical knowledge but also practical skills, research, and industry experience. The graduates are well-prepared to contribute to their fields, thereby enhancing the university's reputation and the value of its academic and industrial partnerships. The doctoral programme is settled on areas of specialisation with core courses. The curriculum is multidisciplinary in nature. Interdisciplinarity is implemented through courses and research activities in collaboration with other departments in the Faculty of Technology and the university. As part of the energy transition and the sustainable development objectives, the doctoral programme includes teaching modules on renewable energies, new uses for electricity, universal and affordable access to electricity, and frugal instrumentation. Research training in ethics is an integral part of the curriculum, ensuring that doctoral students are aware of the ethical considerations associated with conducting research. With contributions by its partners, the Department of Electronic and Electrical Engineering organises compulsory scientific seminars for Ph.D. students, to which all members of the teaching staff are invited. This is an opportunity for Ph.D. students to present the progress of their research. Seminars on research methods are also organised. The doctoral training programme is developed in line with the scientific scope of the institution. It includes coursework, laboratory sessions, industry-based projects that contribute to the development of the doctoral students' research project. The research skills of the students are also improved with opportunities of professional internships in industry where the students can benefit from complementary laboratory facilities (e.g., material characterisation) and compare/assess their methodological approach with industrial realities.

The Department staff members and Postgraduate coordinator run the doctoral programme (courses and research activities) smoothly with all the national and international staff members, supported by the research units. The implementation is done in coordination with staff members, the Postgraduate school and the institution. The professors and researchers of the Department who supervise the doctoral students are involved in the doctoral training programme. The programme staff members use oral inquiries to evaluate the courses. A Department Research Council Board (Postgraduate committee) led by the senior staff member evaluates the research topics relevance.

Ph.D. students are encouraged to take part in conferences for dissemination of their findings, which contributes to their professional development. Although publications in journals are not compulsory, it is highly recommended to publish for those wishing to pursue academic careers. Despite their good reputation, the research units should improve their international visibility with publications in high standard journals and conferences. Indeed, over the last four years, there are few publications in leading journals (with quartile Q1 or at least Q2, indexed in internationally recognised databases) or at international conferences. In order to assess the quality of the work carried out, it would be a good idea to compare the obtained results with those of the international community by encouraging all Ph.D. students to disseminate their research results. Currently, over the last six years, almost 50% of the graduated PhD students have no publication. The doctorate adheres to an open-science-based approach, in which the procedures for depositing doctoral theses and the work of doctoral students and Ph.D. holders in open-access repositories are monitored and supported. The service is offered at the university level with soft and hardcopy of the dissertations.

The doctorate takes into account the social and economic needs to define its objectives and diversify its job prospects in different sectors, including the academic sector. The programme promotes the networking with different partners (alumni, industrials, other academics, etc.). At the Centre level, three advisory boards composed of academic and socio-economic partners (local, national, and international) organise twice a year a workshop for the students. The doctoral programme's academic and socio-economic partnerships are not always formally assessed. Strengthening relations with alumni, through their greater involvement in training, could create the conditions for self-evaluation. The Centre Advisory Boards could help to establish the evaluation framework.

Ph.D. students are often lecturers, assistant professors, or industrials. Beside the specialisation area, the doctoral programme develops a policy for professionalisation to enhance its value with transferable skills, such as leadership, project and research management (grant writing), communication to non-specialised audience, teaching assignments, and teamwork (interdisciplinary project). Thanks to the MoUs signed by the Centre with international academic partners, Ph.D. students can benefit from internship opportunities in foreign universities to improve their pedagogical skills. The alumni network and the Centre of Excellence offer financial support for Ph.D. students to attend international or national conferences. The Centre's Advisory Board organises twice a year an online event opened to academic staff, Ph.D. students, and industrial partners. At the moment, there is no foreign student enrolled in this doctoral programme.

In conclusion, the doctoral programme aligns with the institution's teaching and research strategy. It is consistent with the institution's scientific orientations and thematic priorities: telecommunications and electrical energy, which are strategic sectors for Nigeria. Following the M.Sc. programmes, the doctoral programme aims to enable students to develop high-level scientific and technological skills in electronic and electrical engineering to master the issues associated with reliable, sustainable, and affordable electricity production and electronic communication technologies. There are four specialised areas: Power Systems, Communications, Control and Instrumentation, and Materials and Devices. The programme is therefore supported by four research units which scientific activities are conducted in collaboration with socio-economic partners. It should be noted that one of the research units is co-directed by an academic from an international university.
The Ph.D. programme includes participative training for doctoral students in research methodology, basic and elective courses, laboratory sessions and research projects. It benefits from academic partnerships, in particular agreements with foreign higher education establishments that offer mobility opportunities for lecturers preparing a doctorate. The programme is encouraged to enhance student participation in international conferences and improve its international visibility with publications in top-ranked journals and conferences. Strengthening relations with alumni, mainly through their greater involvement in training, could create the conditions for self-evaluation. The ACE ICT OAK Park Advisory Board could help establish the evaluation framework.

2 – TRAINING, HOSTING AND SUPERVISION ARRANGEMENTS FOR DOCTORAL STUDENTS

The doctoral training programme is based on a mix of compulsory core courses and elective courses that allow for specialisation. To carry out their research activities effectively, the doctoral programme trains Ph.D. students to research design, methodology, and analysis, through formal coursework, seminars, and hands-on workshops. The doctoral students are recruited through an equitable merit-based process defined at the institutional level in association with partners. A handbook including the curriculum, the procedures for the recruitment and the targets is provided to the candidates. The research funds can be provided by the ACE ICT OAK Park, the supervisor, or national agencies (TETFUND National Research Fund, for instance).

The doctoral programme's objectives and the conditions for hosting doctoral students within the institution and in research units are collectively defined and communicated to all partners in the handbook. One-to-one mentorship from experienced Faculty members is tailored to the individual student's research interests. The rules and procedures for supervising doctoral students are defined within the institution in conjunction with its partners and are brought to doctoral students' attention through the handbook. The reciprocal commitments of doctoral students and thesis supervisors (or directors) are clearly defined and communicated to them through this handbook. Therefore, the Faculty, the Department, and the research units provide students with high-quality supervision, and mentorship. Following the guidelines of the university policy, the monitoring and supervision procedures are conducted to reduce discrimination and stereotypes and prevent conflict and harassment. The doctoral school provides stipends to the student and the supervisor if they reach key milestones in recognition of efficient practices.

The University offers access to physical and digital library resources, and contributions to the training content. There are several e-library services supported by a fibre-optic network. International digital library resources are made available through institutional membership. The students can access the resources everywhere on the campus. An open-access public room is also available for the students of the Department who do not have a personal laptop. The research units offer admittance to laboratories (within and outside the Department) and extensive libraries. They also have access to software tools to control instruments (Labview from National Instruments) and numerical modelling (e.g. Matlab®). The programme provides equipment for printed circuit design, semiconductor and materials testing, microwave circuit characterisation, and manufacturing. There is also a studio dedicated to drone control's activities. Although some of the equipment is recent (3D printer), several measurement and observation systems (oscilloscopes, multimeter) are somewhat outdated. The rooms appear to be small, which could lead to safety issues if they were to be used simultaneously by several people. Therefore, based on the data provided (surface and number of students), there might be safety issues to work on.

As defined in the handbook, the rules and criteria for defending doctoral thesis are defined within the institution in association with partners, with the aim of verifying the production of new scientific knowledge and guaranteeing the quality of the doctorate. The doctoral training programme includes support mechanisms for the preparation and development of doctoral students' incoming and outgoing mobility schemes. Incoming students are guided to choose the right courses for their specialisation area and research project, based on their background. Thanks to the MoUs signed by the ACE ICT OAK Park, the students can benefit from outgoing mobility. The doctoral training programme includes a six-month English language course provided by the University's Departments of foreign languages, in support of its internationalisation. These courses are free for foreign students. The doctoral programme includes training that is conducted partially or entirely remotely and relies on digital dissemination (social media) and teaching tools, especially to promote access for remote audiences, including doctoral students on international mobility schemes, living far from the campus or involved in field research.

In conclusion, the University provides a handbook that clearly describes the conditions for recruiting and welcoming students. The rules and criteria for defending a doctoral degree guarantee the quality of the doctorate. They are well-defined and communicated to all parties. Research teams of national and international academics provide high-quality supervision for Ph.D. students. The programme has established a framework that enables students to conduct their research activities, be assessed and defend their thesis within a predictable and reasonable timeframe.
Even though doctoral students can access several platforms with up-to-date equipment, such as 3D printers and PCB design, the electronic and electrical equipment should be renewed and increased. The capacity of computer rooms should also be improved, in particular with the increasing use of optimisation and machine learning techniques. The programme is encouraged to provide funding for all students and promote outgoing mobility for all students, not only lecturers.

3 – ATTRACTIVENESS, PERFORMANCE AND RELEVANCE OF THE DOCTORATE

No sufficient procedures to monitor and analyse the attractiveness of the doctorate are implemented. Moreover, no new incoming doctoral student have integrated the programme since 2021. Therefore, some measures must be added to promote the attractiveness of the programme.

The doctoral programme's partners provide mechanisms to support and develop the doctoral students' training pathway and contribute to its smooth completion. These mechanisms include measures to guarantee the proper conduct of research topic proposal and acceptance, key milestones to evaluate the progress (compulsory seminars with feedback from the faculty members), and thesis writing. The doctoral programme considers the diversity of backgrounds and proposes a flexible curriculum adapted to students with specific needs. The doctorate foresees regular individual monitoring of doctoral students, according to procedures that are clearly defined, comprehensible and transparent for doctoral students and thesis supervisors. The information is available in the handbook provided to the students when they start the programme.

The doctorate's relevance is analysed by assessing quality of Ph.D. holders' career pathways and measured through occupational follow-up. As examples of reflection of the high-quality education received from the Department, several graduates have successful careers in industry (Nigerian Communications Commission), and well-known foreign universities (MIT and UC Santa Barbara in USA, TU Delft in Netherlands, and Wollongong University in Australia). Currently, there is no formal alumni network. There are several individual initiatives from Ph.D. holders: co-supervision of students, mentorship, informal contact to provide field data for industry-based projects, and internship offer. The monitoring could be further improved with cohort surveys in coordination with a strong alumni network and the feedback from the employers.

In conclusion, the programme has implemented an effective strategy to ensure the success of its students: the research topic is defined jointly by the student and the prospective supervisory team and then assessed by a departmental committee. Students are then monitored regularly and present the progress of their work at two compulsory seminars before all Department members to ensure their ability to defend their doctoral thesis within the required timeframe. The doctoral programme boasts some success stories, including in the international academic world. However, it would benefit from developing its national and international appeal, and more generally its attractiveness, as no doctorate student has integrated the programme since 2021. The doctoral programme is also encouraged to improve student progress monitoring, from registration to professional integration. The strengthening of the alumni network could help keeping track of students.

4 – MANAGEMENT AND CONTINUOUS IMPROVEMENT OF THE DOCTORATE

The institution has established a doctoral supervision policy outlined in the handbook, which adheres to clear, shared, and comprehensive criteria. Doctoral supervisors and support staff can benefit from the institution's

policy framework that encourages incoming and outgoing mobility: two alumni had mobility experiences of several months in Italy (Trieste) and the United States (Tennessee Tech University) for training and research work. Travel grants are offered by the Centre of Excellence to attend international conferences. Support, guidance, and training are provided to supervisors involved in the doctorate and are beneficial to the quality of the doctoral training programme and doctoral supervision. Indeed, staff members can broaden and update their supervisory and pedagogical skills, and expand their network of collaborations during stays at foreign universities that have signed an MoU with their university (MIT, USA, for instance). Staff members are also trained by industry partners, e.g. from Quansas experts (a company in Canada), which supplies the Department with scientific equipment. Therefore, the doctorate contributes to the institution's capacity-building efforts.

The doctoral supervisors benefit from financial resources (research grants or funding from companies or national agencies, such as TETFund, which has provided funding for two students). The postgraduate school policy allows supervisors and students to be rewarded when they reach a key milestone within the allotted time. It can also contribute to the promotion of the supervisor. Currently, there is no formal evaluation organised by the doctoral supervisors of the doctoral training programme by doctoral students: a questionnaire is provided to students by each teacher, who collects the answers himself.

In conclusion, an experienced team of national and international teaching and research staff leads the doctoral programme. It is supported by a technical staff and benefits from training provided by industrial partners or alumni. Regarding the financial resources, besides the input from the University, there can be research grants for supervisors and scholarships for students from national agencies (TETFund). The staff members benefit from outgoing mobility in foreign universities (MIT, USA) to improve their pedagogical skills and update their knowledge. Industrial experts also train them on the new scientific equipment of the Department. Therefore, they contribute to the institution's capacity-building efforts. A quality policy defined at the university level is implemented in the Department.
Although there is an assessment process involving doctoral students, the programme is encouraged to make it formal and follow a more rigorous pathway. The postgraduate committee, the Centre's Advisory Board, and the doctoral supervisors could analyse the survey results to propose corrective actions. This would strengthen the programme's continuous improvement process. It should also be relevant to offer more lifelong education opportunities to the non-teaching technical staff members who play a key role in the experimental activities.

VI. CONCLUSION

The Electronic and Electrical Engineering doctoral programme at Obafemi Awolowo University, Ile-Ife, trains students of a very high level. Graduate students have acquired the skills and knowledge to be key actors at the country level, in industrial strategic sectors (telecommunication, electronics, and power utility), and universities. The management teams (Department, post-graduate school and ACE ICT OAK Park programme) cooperate in a perfectly coherent and organised way to run the programme.

A handbook provided to the students clearly describes the procedures from the recruitment to the thesis defence. The course content is comprehensive and relevant, and matches the multidisciplinarity of Electronic and Electrical Engineering, combining fundamental courses and technology, renewable energy and energy economics, with hands-on laboratory sessions. Four specialisation areas in line with the national agenda to train highly qualified scientists in crucial technology sectors that will support the country's economic development are proposed (Power Systems, Communications, Control and Instrumentation, and Materials and Devices). The doctoral programme is supported by four research units whose topics align with the specialisation areas. Each research project results from a discussion between the candidate and the potential supervisors on its scientific relevance and socio-economic impact. Then, the Department Research Council evaluates the Ph.D. student research project. The two-year research project, which may be experimental and/or theoretical, is supervised by several staff members from the Department or the Faculty of Engineering, and/or industrial partners. The research project is rigorously monitored over the two years, with a handbook, regular meetings, and seminars.

The facilities offered by the programme are globally satisfactory. The students have access to laboratory equipment within the Department and the Faculty, and they can also utilise platforms and data provided by partners, including national agencies like the National Electrical Power Centre at Ife and companies. However, to support the objective of being a top leader in the domain and strengthen the position of the programme regarding ever-growing technological requirements, it would be relevant to increase the financial and material support from the partner institutions. This will make it possible to replace obsolete equipment in the electronic and power systems laboratories (oscilloscopes, electronic measuring devices, etc.) and increase the capacity of equipment such as 3D printers. The socio-economic partners could also enlarge their support by providing financial support. The alumni network deserves to be strengthened to encourage more donations.

Many graduates of the programme have gone on to great professional success in both industry and academia. However, the programme would benefit from increasing and diversifying its recruitment both nationally and internationally. This could be achieved by increasing the visibility of the research teams through publication in leading international journals and conferences, implementing an attractiveness policy and developing international collaborations to encourage outgoing mobility for all students, not just lecturers. Also guaranteeing good financial conditions for students by awarding full scholarships would enable them to concentrate more on their research work.

Finally, the Department is encouraged to implement a formal monitoring of the students from their enrolment to their graduation, and during their professional lives. It would enable the programme to be assessed and ensure that it remains relevant to industrial and economic issues. Strengthening relationships with alumni would also help students and the Department to benefit from their experiences and resources.

Overall, training in electronics and electrical engineering at Obafemi Awolowo University is based on solid foundations linked to its longevity and undeniable success in training high quality scientists, recognised nationally and internationally, in industry and academia. The process of continuous improvement of the curriculum and efforts to build staff capacity are key to keeping training at its current level.

STRENGTHS

- The good alignment of the programme with the University objectives. The programme is relevant to mastering the light and heavy currents, essential for Nigeria to achieve its national development objectives
- The two-year research project, which enables students to develop their research and soft skills and evaluate their innovation capabilities
- The resources provided by the Centre of Excellence, which benefit to the programme
- The high scientific level teaching national and international staff
- The successful international academic careers of the alumni

WEAKNESSES

- The lack of funding for living and research activities for the students
- The sometimes outdated laboratory equipment and the insufficient security measures
- The still limited international relations and visibility
- The insufficiently broadened and strengthened partnerships
- The insufficiently developed monitoring of students during their studies, their integration and their progress into the labour market

RECOMMENDATIONS

- Increase the financial resources with more applications to national and international project calls. Partners in public institutions and companies could also be approached through an alumni network.
- Develop collaborations with foreign programmes and laboratories, to facilitate increased incoming and outgoing mobility for both students and staff.
- Strive to publish regularly with the students in top-ranked journals and conferences.
- Expand relations with companies with more collaborative research works.
- Institute a formalised follow-up of students and alumni and strengthen the programme with courses and seminars on soft skills to enhance integration into the job market.

VII. COMMENTS OF THE INSTITUTION

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Ref.No/VC.101/ACE/Vol.XII/013 6th May 2024

The President,
High Council for the Evaluation of Research and Higher Education,
2, Rue Albert Einstein,
75013 Paris,
France.

Re: Hcéres - Evaluation Report on Ph.D. Electronic and Electrical Engineering Programme

Thank you for your mail dated April 9, 2024 on the above subject matter.

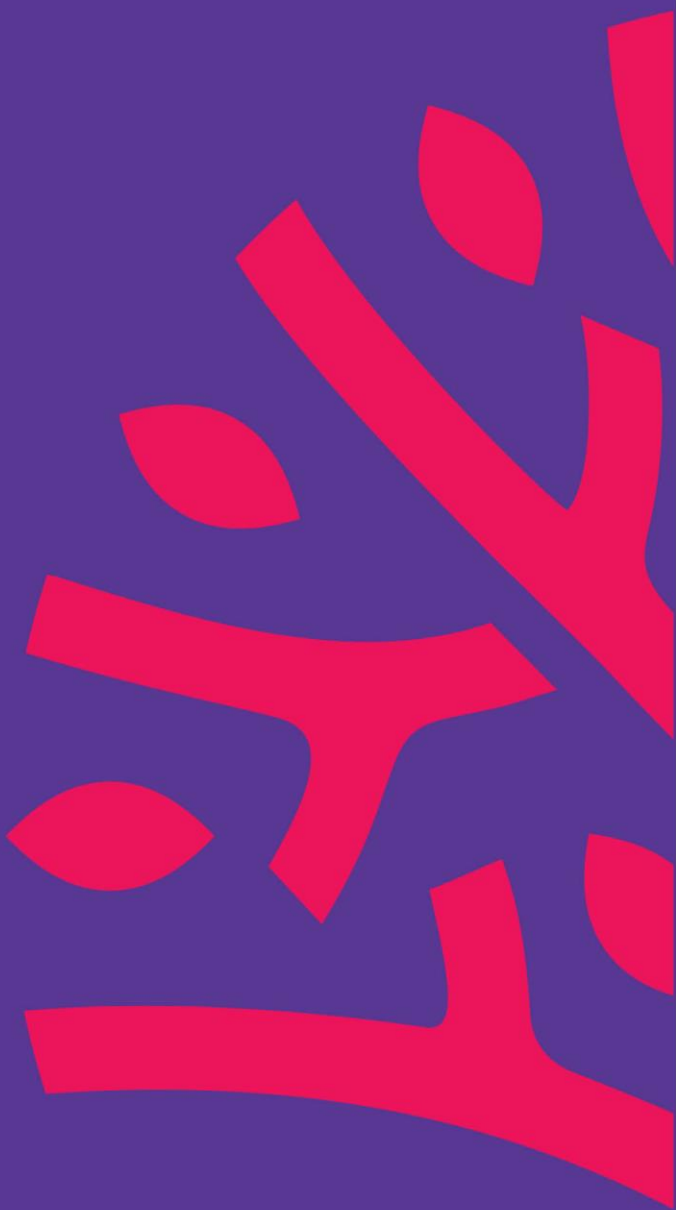
On behalf of the Obafemi Awolowo University, I am pleased to inform you that our team went through the provisional report and all the information on the report is a true reflection of the programme.

There is no comment of a more strategic nature on the content and substance.

Please go ahead to submit the report for further processing and final approval.

Kind regards,

Prof. Adebayo Simeon Bamire
Vice-Chancellor



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International evaluation and accreditation

ACCREDITATION DECISION

Ph.D. Electronic and Electrical Engineering

Africa Centre of Excellence for ICT-Driven Knowledge Park (ACE OAK-Park)

Obafemi Awolowo University

Ile-Ife, Nigeria

June 2024

SCOPE OF THE ACCREDITATION GRANTED BY HCÉRES

HCÉRES has based its evaluation process on a set of objectives that study programmes must pursue to ensure recognised quality within France and Europe. These objectives are divided up into four accreditation criteria.

The Accreditation Commission issues an opinion about the accreditation of the study programme after examining the file. The Hcéres President takes the decision based on the Commission's opinion and the final evaluation report of the programme. This accreditation decision, taken in plenary session, is the result of a collegial and reasoned process.

The decision issued by Hcéres regarding the accreditation of the study programme corresponds to the awarding of a label to the evaluated entity.

This decision is independent of the accreditations carried out by the French State and therefore does not entail recognition in France of the institution or the diplomas delivered by it.

Decision No. EI-2024-35 on the accreditation of the Ph.D. Electronic and Electrical Engineering, delivered by Obafemi Awolowo University, Zaria, Nigeria

The President of the High Council for the Evaluation of Research and Higher Education,

Considering the Research Code, in particular Articles L. 114-3-1 to L. 114-3-6;

Considering the Board's deliberation of 29th September 2022 on the accreditation criteria for a doctorate/PhD abroad;

Considering the Decision No. 2023-9 of 16th March 2023 on the international accreditation procedure of the High Council for the Evaluation of Research and Higher Education;

Considering the agreement DEI_2023_CONV17 of 14th June 2023 for the evaluation/accreditation of fourteen training courses, delivered by six Centres of Excellence in Nigeria;

Considering the opinion issued by the Accreditation Commission on 18th June 2024;

Decides:

Article 1

Noting that the Ph.D. Electronic and Electrical Engineering delivered by Obafemi Awolowo University in Nigeria meets the four accreditation criteria, voted by the Board of the High Council on 29th September 2022, as follows:

ACCREDITATION CRITERION 1: DOCTORAL POLICY

The doctoral programme aligns with the institution's teaching and research strategy. It is consistent with the institution's scientific orientations and thematic priorities: telecommunications and electrical energy, which are strategic sectors for Nigeria. Following the M.Sc. programmes, the doctoral programme aims to enable students to develop high-level scientific and technological skills in electronic and electrical engineering to master the issues associated with reliable, sustainable, and affordable electricity production and electronic communication technologies. There are four specialised areas: Power Systems, Communications, Control and Instrumentation, and Materials and Devices. The programme is therefore supported by four research units which scientific activities are conducted in collaboration with socio-economic partners. It should be noted that one of the research units is co-directed by an academic from an international university.

The Ph.D. programme includes participative training for doctoral students in research methodology, basic and elective courses, laboratory sessions and research projects. It benefits from academic partnerships, in particular agreements with foreign higher education establishments that offer mobility opportunities for lecturers preparing a doctorate. The programme is encouraged to enhance student participation in international conferences and improve its international visibility with publications in top-ranked journals and conferences. Strengthening relations with alumni, mainly through their greater involvement in training, could create the conditions for self-evaluation. The ACE ICT OAK Park Advisory Board could help establish the evaluation framework.

ACCREDITATION CRITERION 2: TRAINING, HOSTING AND SUPERVISION ARRANGEMENTS FOR DOCTORAL STUDENTS

The University provides a handbook that clearly describes the conditions for recruiting and welcoming students. The rules and criteria for defending a doctoral degree guarantee the quality of the doctorate. They are well-defined and communicated to all parties. Research teams of national and international academics provide high-quality supervision for Ph.D. students. The programme has established a framework that enables students to conduct their research activities, be assessed and defend their thesis within a predictable and reasonable timeframe.

Even though doctoral students can access several platforms with up-to-date equipment, such as 3D printers and PCB design, the electronic and electrical equipment should be renewed and increased. The

capacity of computer rooms should also be improved, in particular with the increasing use of optimisation and machine learning techniques. The programme is encouraged to provide funding for all students and promote outgoing mobility for all students, not only lecturers.

ACCREDITATION CRITERION 3: ATTRACTIVENESS, PERFORMANCE AND RELEVANCE OF THE DOCTORAL PROGRAMME

The programme has implemented an effective strategy to ensure the success of its students: the research topic is defined jointly by the student and the prospective supervisory team and then assessed by a departmental committee. Students are then monitored regularly and present the progress of their work at two compulsory seminars before all Department members to ensure their ability to defend their doctoral thesis within the required timeframe. The doctoral programme boasts some success stories, including in the international academic world. However, it would benefit from developing its national and international appeal, and more generally its attractiveness, as no doctorate student has integrated the programme since 2021. The doctoral programme is also encouraged to improve student progress monitoring, from registration to professional integration. The strengthening of the alumni network could help keeping track of students.

ACCREDITATION CRITERION 4: MANAGEMENT AND CONTINUOUS IMPROVEMENT OF THE DOCTORAL PROGRAMME

An experienced team of national and international teaching and research staff leads the doctoral programme. It is supported by a technical staff and benefits from training provided by industrial partners or alumni. Regarding the financial resources, besides the input from the University, there can be research grants for supervisors and scholarships for students from national agencies (TETFund). The staff members benefit from outgoing mobility in foreign universities (MIT, USA) to improve their pedagogical skills and update their knowledge. Industrial experts also train them on the new scientific equipment of the Department. Therefore, they contribute to the institution's capacity-building efforts. A quality policy defined at the university level is implemented in the Department.

Although there is an assessment process involving doctoral students, the programme is encouraged to make it formal and follow a more rigorous pathway. The postgraduate committee, the Centre's Advisory Board, and the doctoral supervisors could analyse the survey results to propose corrective actions. This would strengthen the programme's continuous improvement process. It should also be relevant to offer more lifelong education opportunities to the non-teaching technical staff members who play a key role in the experimental activities.

Article 2

The Ph.D. Electronic and Electrical Engineering delivered by Obafemi Awolowo University in Nigeria, is accredited for a period of three years, which may be extended for two years, subject to a follow-up that may include an on-site visit.

Article 3

The decision is accompanied by the following recommendations and comments:

- Increase the financial resources with more applications to national and international project calls. Partners in public institutions and companies could also be approached through an alumni network.
- Develop collaborations with foreign programmes and laboratories, to facilitate increased incoming and outgoing mobility for both students and staff.
- Strive to publish regularly with the students in top-ranked journals and conferences.
- Expand relations with companies with more collaborative research works.
- Institute a formalised follow-up of students and alumni and strengthen the programme with courses and seminars on soft skills to enhance integration into the job market.

Article 4

This decision will be published on the Hcéres website.

Paris, 27th June 2024

The acting President

signed

Stéphane Le Bouler

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