

EVALUATION AND ACCREDITATION DOCUMENTS

M.Sc. Civil Engineering

Africa Centre of Excellence in New Pedagogies
for Engineering Education (ACENPEE)

Ahmadu Bello University

Zaria, Nigeria

June 2024

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International evaluation and accreditation

EVALUATION REPORT

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January 2024

The Ahmadu Bello University has mandated the Hcéres to perform the evaluation of its Civil Engineering M.Sc. 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 committee¹ :

Olivier Boutin, President of the committee

In the name of Hcéres¹ :

Stéphane Le Boulter, Acting President

¹In 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.

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I. STUDY PROGRAMME IDENTITY SHEET

- University: Ahmadu Bello University (ABU), Zaria, Nigeria
- Department concerned: Department of Civil Engineering
- Title of the programme: M.Sc. Civil Engineering
- Year of creation and context: 1966. The Faculty of Engineering of ABU is the oldest in Nigeria. It started in 1955 as a Faculty of Engineering of the University College, Ibadan. In 1962, the University took over responsibility for the Faculty of Engineering Education and the faculty of Engineering in Ahmadu Bello was born. Postgraduate studies in the Department of Civil Engineering started in the late 1960s, with the first set graduating in 1968.
- Site where the programme is taught (town and campus): Department of Civil Engineering, Campus Samaru, Ahmadu Bello University (ABU), Zaria, Nigeria

PROGRAMME DIRECTOR

- Surname, first name: Amartey, Sada Hassan Bilkisu
- Profession and grade: Reader
- Main subject taught: Civil Engineering

METHODS AND RESULTS OF THE PREVIOUS ACCREDITATION(S)

- In 2022, the programme was evaluated by the National Universities Commission (NUC). The programme received its full accreditation by the NUC for 5 years, from March 2022 to March 2027.
- No previous international accreditation. Three other programmes from the ACENPEE (M.Sc. Mechanical Engineering, M.Sc. Chemical Engineering and M.Sc. Water Resources) are being evaluated by Hcéres in 2023.

HUMAN AND MATERIAL RESOURCES DEDICATED TO THE PROGRAMME

- **Human resources**

Academic staff	Professors	Senior Lecturers	Readers	Lecturers	Total
	9	3	4	6	22
Technical staff	Technical Officers	Technical Assistants	Technologists	Others	Total
	9	8	5	6	28
Administrative staff	Typists	Chief Computer Operator	Office Assistants	Others	Total
	2	1	2	2	7

- **Material resources:** computer lab, smart classrooms, open access and subscribed data bases, video conferencing applications (Zoom, Skype, Google Meet), learning management devices, lecture theatres, laboratories (soil mechanics, structural mechanics, material characterisation, hydraulic, etc.), workshop (welding and fabrication, machine tools, carpentry, electrical), Central University Library, the Department has a functional physical Library. There is also a collection of e-books and other relevant publications. There is an e-library at the Central University Library with a large collection of current e-books, journals, patents, theses, dissertations, etc. The Central University Library procures access to eleven commercial databases.

STUDENT POPULATION: EVOLUTION AND TYPOLOGY OVER THE LAST 4 YEARS

		2018/2019	2019/2020	2020/2021*	2021/2022	2022/2023*
Enrolment	Male	54	30	-	39	-
	Female	0	3	-	4	-
	Total	54	33	-	43	-
	<i>including foreigners</i>	0	0	-	0	-
Graduates	Male	20	25	-	38	-
	Female	6	5	-	4	-
	Total	26	30	-	42	-
	<i>including foreigners</i>	-	-	-	-	-

II. 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. candidate, ENS-PSL Paris, France

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

III. VISIT DESCRIPTION

- **Date of the visit:** the visit took place on Monday 4th December 2023.
- **Summary of the proceedings:** before the visit took place, the self-evaluation report and numerous appendices had been 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 during one day, according to a schedule agreed between the ACENPEE, the NUC and the panel. During the visit, the experts asked for a few more documents to get quantitative data. All of these documents were received.
- **Organisation of the visit:** for safety reasons, the visit was organised in hybrid mode in Abuja and the panel was not able to visit the Centre in Zaria. The Centre leaders, programme director, postgraduate coordinator, and some students and academics of the Ahmadu Bello University met the panel in Abuja.
- **Cooperation of study programme and institution to be accredited:** ACENPEE has been cooperative throughout the process. The self-evaluation report was sent according to the agreed schedule. The questions asked before and during the visit were answered clearly and precisely. The panel is satisfied with the conclusion reached, which is based on available and relevant information. Moreover, the involvement of the National Universities Commission has been very helpful throughout the process.
- **People met:** the experts' committee was able to meet with 39 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

IV. PRESENTATION OF THE STUDY PROGRAMME

1 – PRESENTATION OF THE STUDY PROGRAMME

The Centre for New Pedagogies in Engineering Education is an Africa Centre of Excellence hosted by Ahmadu Bello University in Zaria, Nigeria, implemented as part of the ACE Project supported by the World Bank in 2019. The Centre was established to enhance engineering education by experimenting with new teaching methods, developing curricula and transferring these results into the classrooms of tomorrow's engineers, to respond creatively and responsibly to 21st century challenges. Therefore, its stated mission is to provide a world-class teaching and learning environment that fosters innovation in techno-pedagogical skills and competencies essential for engineering education and practice. Several programmes are hosted in the Centre, such as Mechanical Engineering, Chemical Engineering and Environmental Engineering.

The M.Sc. Civil Engineering programme was created in 1966 and has been hosted by the ACENPEE since the implementation of the ACE Project. It aims to train skilled manpower in Civil engineering, and prepare candidates for self-employment. Graduates are trained for research and to industry roles, and are capable of working in both the public and private sectors. The postgraduate programme is structured into four areas of specialisation: Structural Engineering, Highway and Transportation Engineering, Geotechnical and Geo-environmental engineering, and Construction materials. This is a four-semester (two-year) post-bachelor programme leading to master's degree in engineering. The curricula require a sound basis in Engineering Mathematics, Mechanics of Materials applied to Civil Engineering and Numerical Modelling. Teaching is also given in other relevant areas that have direct impact on the profession such as law, management and entrepreneurship or water resources engineering.

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

The Faculty of Engineering 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 submitted self-evaluation report was very rich, with a lot of appendices (544 pages) providing qualitative and quantitative data. A few additional documents were requested and received within the week.

V. EVALUATION REPORT

1 – TRAINING POLICY AND CHARACTERISATION

The M.Sc. programme is perfectly in line with the institution's strategy and is hosted by the Civil Engineering Department in the Faculty of Engineering at Ahmadu Bello University. The Department was created in 1962 and the programme started in 1966 within the Department of Civil Engineering. The programme is designed to foster and advance building construction and infrastructure in Nigeria, aiming to meet professional needs by producing highly skilled professionals. The programme is one of the first programme in this field in Nigeria. It is clearly dedicated to local and national construction and infrastructure buildings. 48 other universities offering a similar programme have been identified nationwide. The programme belongs to the Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE), which is common to several Engineering programmes at Ahmadu Bello University. Some students of the Master's degree in Civil Engineering are part of this programme. It is worth mentioning that the programme is developed coherently and complementary with other study programmes in the same academic cycle, particularly with M.Sc. programmes dealing with other aspects of engineering (chemical engineering, mechanical engineering, biology, water resources, etc.). It is clearly defined following the Department of Civil Engineering scope, with four postgraduate programmes leading to an M.Sc. and one doctoral programme.

The academic partnerships are very well identified, at the local (4 laboratories), national (6 laboratories) and international levels. They are complementary in terms of research topics and relevant with the programme. The programme benefits from three research-based laboratories, namely Highway and Transportation Laboratory, Concrete Materials and Heavy-duty Laboratory, Soil Mechanics Laboratory and Structural Laboratory, enabling teaching, practical work and research to be developed in a single location. These research units and two supporting laboratories, Welding (Steel Fabrication) Laboratory and Carpentry (Woodwork) Laboratory, belong to the Department of Civil Engineering. It is also mentioned that other laboratories (Nigerian Liquefied Natural Gas Laboratory, Continuing General Engineering research equipment at the University, etc.) and Chemical Engineering Materials Laboratory (for general material processing), are located in the department and used by the programme. The department also has informal relationships with other laboratories in Nigeria, which are complementary to its own activities, particularly in areas such as mechanical or material characterisations. Students can carry out practical work and research activities in the Department's laboratories. They must provide a letter of introduction from their supervisor to gain access to the equipment in the partner laboratories. The Department has international partnerships with universities in Malaysia and the UK for staff training. A memorandum of understanding has been signed with Central South University (China) at the Ahmadu Bello University level. International university partnerships for outgoing student mobility have been identified (universities in Malaysia, China and the UK), with 16 effective mobility schemes over the last four years. All outgoing students receive financial support, from the TETFund, the Petroleum Technology Development Fund or the ACENPEE programme. During the evaluation period, no incoming student mobility was identified.

In the programme, multidisciplinary and interdisciplinarity are well-covered through several general courses on water resources, hydrology engineering, as well as law, management & entrepreneurship or applied econometrics. Moreover, there are numerous exchanges between the different departments of the Faculty of Science, such as joint supervision of research projects, leading to strong interdisciplinarity. In addition, various issues related to sustainable development concerns are addressed in the different courses, such as materials recycling, waste management or water resource engineering. However, there are no specific courses devoted to this subject, which could be beneficial for students.

The M.Sc. programme comprises a mandatory one-year minimum research project conducted under the guidance of two senior researchers. Most research topics are focused on practical works. During the two years, each M.Sc. student must propose three scientific seminars open to all M.Sc. and Ph.D. students. Their research projects are defined and validated during the second semester of the first year and are conducted during the second year in one of the research laboratories. The final presentation is made in front of at least one external examiner and two internal examiners. The number of applicants to the M.Sc. in Civil Engineering is much higher than the capacity of the M.Sc. programme. Therefore, to offer a high standard of support and relevant supervisors for each research project, only a third to a half of the applicants are enrolled. The M.Sc. programme is linked to a Ph.D. in Civil Engineering in the Department. The list of academic staff provided indicates that all professors are specialised in a field connected with the programme curriculum (Geotechnics, Structures, Transportation, etc.), and that most of them have an effective research activity leading to a satisfying *h*-index. There are four research groups, one for each specialisation. There is therefore a perfect match between teaching activities and research activities.

Research integrity and ethics, as important objectives, are fully developed in documents at Ahmadu Bello University (details are given on recruitment procedure, staff integrity, scientific publication management, etc.). However, there is no specific training on research integrity and ethics for the students, although these aspects are embedded in most of the courses. There is a focus on anti-plagiarism. The research-based learning and courses on research methods proposed in the curriculum are available through the Central University Library and a library located in the Department. The university also provides access to Elsevier and ScienceDirect journals, book-chapters databases, and an e-library with collections of e-books, journals, patents, etc.

The study programme considers socio-economic needs, as the different courses are oriented on current and future socio-economic challenges linked to building constructions and infrastructure, while considering environmental aspects (environmental engineering and water resources engineering). As defined in the Learning and Teaching Policy, the University provides opportunities for continuing education through graduate programs, certificate programs, and professional development courses, through its institutes and Centres. This should help teachers to stay updated with the latest developments in the field and enhance their teaching skills. Moreover, academic and technical staff have the opportunity to receive free training from companies on new equipment or software. This is made possible by the Alumni who are proactive with the Department. Most of the existing partnerships between the programme and institutions engaged in an activity related to the programme (for instance the Steel Raw Material Kaduna, the Geological Research Centre Barnawa, Kaduna, and the National Water Resources Institute, Kaduna) are informal. These institutions mainly provide funds for student scholarships and research grants. All students belonging to the ACENPEE programme receive a scholarship. There are also partnerships with 14 national companies, several of which benefit from the equipment available in the research laboratories through contracts with the Department. These numerous partnerships demonstrate the attractiveness of the programme for socio-economic partners. They can provide regular seminars/webinars, online or on-site, to present their company and job opportunities through WhatsApp or other social networks. At Ahmadu Bello University, students are trained to prepare for job-market integration at the undergraduate level during the six-month training of the B.Eng. programme. However, post-graduates are prepared for the job market only through the social networks of alumni or through exchanges at the end of seminars/webinars.

In conclusion, the M.Sc. Civil Engineering is in line with the university's strategy and the socio-economic needs. This M.Sc. is complementary to the other programmes offered by the university's Faculty of Engineering and has been awarded the "African Centre of Excellence" label. The programme tackles the challenges associated with building construction and infrastructure in a comprehensive and engaging manner, with due consideration to environmental concerns. To reach out the objectives, the programme proposes numerous strong links with research and socio-economic partnerships at the national level. To carry on research work, the required facilities (equipment, library, and software) are available within the Department, allowing the students to develop their one-year research project. Other national laboratories complement their research needs, for example in materials characterisation.

The students can pursue a Ph.D. programme in the same Department. It would be interesting to add core courses on ethics and research integrity. Links with socio-economic partners are long-standing and well-established, thanks to several effective partnerships with public institutions and private companies, which add value to the programme. It would be beneficial to engage these partners more actively by having them to contribute to the development of the programme and offer additional professional seminars.

MoUs have been signed at the University level, allowing outgoing mobility with foreign universities and international partnerships. Despite the local situation, these international exchanges could be improved, in particular regarding the incoming of foreign students.

2 – PEDAGOGICAL ORGANISATION OF THE STUDY PROGRAMME

A Post Graduate Programme is available in the Department of Civil Engineering clearly stating the objectives and contents. A detailed curriculum is provided, defining the different core courses with a comprehensive description of the contents. The different approaches (theoretical as well as practical) are well set, for instance concerning the numerical methods, and mechanics of different materials used in construction (soils, cement and bituminous materials). Some of the courses are proposed by other Departments (through waste containment facilities, for instance). The programme structure enables the progressive specialisation of students, with core courses on basics in civil engineering during the first semester, followed by elective courses during the second semester in each of the four options: Structural Engineering, Highway and Transportation Engineering, Geotechnical and Geo-environmental Engineering and Construction materials. The second year is dedicated to defining and writing students' research proposals, as well as participating in and attending two progress seminars. Moreover, students can choose and attend electives proposed in other Departments of the Faculty of Engineering. General knowledge and skills to be acquired are indicated in a useful Handbook of studies, which is available to everyone. Moreover, in the notebook given to students for their research project, the different skills that should be acquired are listed (academic, technical, communication, etc.).

Several teaching methods are proposed in the programme combining lectures, assignments, homework, individual and group projects, tutorials, seminars and presentations. In most courses, one credit out of three is dedicated to lab works. Technical staff carry out experiments for the whole group, which is then divided into sub-groups so that students can experiment on their own. More practical works dedicated to industrial concerns are recommended. For the promotion of students' success, a Guidance and Counselling Centre to assist students at the University level. An orientation service is proposed by the Postgraduate School. Mentoring during the research project and tutoring during tutorials are also available to support students in achieving success. The two supervisors who follow the students during the research project can also help them regularly. Each student is required to maintain an individual notebook to document their progress. Additionally, monthly oral presentations provide students with an opportunity to showcase their progress and discuss any personal or professional difficulties they might be facing. During the two-year programme, students are required to deliver oral presentations in at least three seminars to demonstrate their progress before graduation.

As some courses must be delivered online, hybrid courses are offered. This is an opportunity for students living far from the University. However, regular Internet connection problems have been reported. It is therefore strongly recommended for these courses to be systematically recorded and made available to all students. A computer room is open to all students during daily hours, and software licences are provided at the University level for Matlab for example or at the Department level for specialised software. The use of information and communication technologies are embedded in several courses of the programme and during the research project. A programme has been set up at the university level for incoming non-English-speaking foreign students, including a six-month English language training before starting the M.Sc. programme. However, it appears that students are not sufficiently prepared for outgoing mobility programmes.

Alumni and professionals from partner companies are invited to present their work, share the skills required for their roles, and discuss the challenges facing society and industry. Entrepreneurship is only taught during the last semester: the programme is encouraged to offer such a course to all students during their second year. A one-month internship (at least) in a private company is mandatory for students selected in the ACENPEE programme. The companies are selected and provided by the programme and validated by the World Bank. Although seminars and workshops are sometimes given by socio economic partners, which provide elements to students for further job market integration, it is important to give them more formal possibilities to acquire relevant skills.

In conclusion, the curriculum of the M.Sc. programme is consistent and set in a comprehensive manner. Over a two-year period, on the basis of well-chosen and organised courses, students take the core and elective courses required for building and infrastructure construction. Interdisciplinarity and multidisciplinary are proposed through courses available in other Departments of the University. The knowledge and skills are well-defined and address the main challenges of the socio-economic domain of Constructions. The teaching methods are well diversified. It is recommended for the acquisition of information and communication skills to be further developed.

A one-month work placement is only compulsory for students on the ACENPEE programme, which is a second stage of professional immersion. It appears actually that all students have already completed a six-month work placement during the B.Eng. programme. A one-year research project combining practical and theoretical work is proposed. Students are strategically connected with socio-economic partners. They only have access to international opportunities through social networks and communication with alumni, although a holistic approach is taken by the Policy Assurance Committee at university level. In addition, even if they are partially addressed, additional skills useful for their integration into the labour market could be more formally offered to M.Sc. students.

3 – ATTRACTIVENESS, PERFORMANCE AND RELEVANCE OF THE STUDY PROGRAMME

At the University level, a Learning and Teaching Policy proposes a framework for monitoring the evaluation admission and examination processes, the procedure for the recruitment of qualified academic staff, and the assessment of students and teachers. At the Department level, an M.Sc. programme assessment is proposed using a Google form that is an easy and accessible way to reach out graduated students and current students. The results are sent to the Quality Assurance Committee, whose analysis is passed on to the department to help improve the curriculum.

The number of applicants is monitored each year. It appears that this programme is very attractive, with over 100 candidates applying each year (up to 130) and around 40 registered. The acceptance rate is between 30 and 50%. During the evaluation period, there were 337 applicants, and 130 were enrolled. The trend seems stable over this period, with a slight decrease in the number of applicants over the last year. The success rate is one of the key indicators discussed at a conference attended by student supervisors, the Head of Department and the Deputy Dean. The success rate is also measured. However, the data available was collected using the above-mentioned Google-developed survey and is not provided directly by the Department. According to this

survey, approximately 70% of students graduate each year with an M.Sc. degree. Some students start their M.Sc. studies and eventually leave the country to continue their studies abroad.

The job-market integration is also monitored, and available data was collected with the same survey. The categories for job-market outcomes include pursuing a doctoral degree (Ph.D.), enrolling in a certificate program, being employed full-time, being employed part-time, participating in an internship or co-op, or being engaged in job hunting. The collected data are grouped in three categories: Employed, Not Employed and Continuing Studies. During the evaluation period, based on the survey, 111 graduates are employed, 31 are continuing studies, and only 13 are not employed. The Department employs social media platforms, notably WhatsApp groups, to stay connected with students after graduation. However, no specific data was provided regarding the use of these tools.

In conclusion, the attractiveness of the programme is conveniently monitored. The number of applicants is high compared to the available opportunities. The choice has been made to remain selective in recruiting students, with 30 to 50% enrolled to take account of capacity and the availability of supervisors. The monitoring is done using a simple and accessible Google form. This survey is also a tool for evaluating the M.Sc. programme, and the results are sent to the Quality Assurance Committee, which makes recommendations to the Department. Monitoring job market integration shows that graduates are very well integrated, with 91% employed, mainly in the business sector or doctoral programmes. Modern social media are also used by the programme to stay in contact with graduates.

4 – ACADEMIC PROGRAMME MANAGEMENT AND CONTINUOUS IMPROVEMENT

An organisational chart is provided showing a clear repartition of the role of everyone involved in the management of the programme with a clear degree of subsidiarity. The Department is led by a Head of Department who is an academic. Secondly, a clearly identified person acting under the authority of the Director General is responsible for the administrative staff, the Department librarian, the technical staff and the academic staff. The four areas of research and the four specialisations correspond perfectly, making it easier to match the four different laboratories and the four research groups, led by an identified person. The organisation of the Department, the objectives of the postgraduate programme and the staff list are available to all students in the Departmental Postgraduate Handbook. A Prospectus of Postgraduate Studies and Regulations Governing Higher Degree Studies at Ahmadu Bello University is available describing the rules and regulations guiding the conduct of the postgraduate programme. There are several councils and boards in the Institution: the Departmental Postgraduate Board, the Faculty Postgraduate Board and the School of Postgraduate Studies (SPGS) Board. There also are three Quality Assurance Committees, one at each level (Institution/Central, Faculty and Department). The roles, members and frequency of meetings are provided. There are identified academic officers within the Department as for example the postgraduate coordinator, the Registration Officer or the Examination officer. The registration and the examination procedures are clearly defined and transparent, and are available to the students. The information regarding minimum credits that must be obtained by students during the first year, the whole process e. g. regular meetings, seminars, and defence is written and shared.

The Department is very well endowed in terms of researchers and teaching staff, and benefits from effective support. The list of teachers and the technical staff is also provided. The Department has 22 academic staff, 28 technical staff and 7 administrative staff. The number of academic, technical, and administrative staff seems sufficient for the number of students. As the courses comprise laboratory work during the first year, the students interact with technicians who set up and run the laboratory works for the whole class. Interactions with teachers, researchers and technicians are also promoted during the research project (second year). This project is carried on under the guidance of two supervisors, the principal supervisor being a member of the relevant research group that can adequately host the Master's students. Several seminars, given by external lecturers who have a close relationship with the programme, provide an insight into how the knowledge acquired during lectures and tutorials can be used appropriately to solve practical problems. In addition, teaching assistants and teachers are welcomed into companies to be trained in the use of new or updated software or equipment. These opportunities, while very useful, are informal and could be more beneficial if formal, long-term partnerships were established. With the help of the ACENPEE programme and National Funding Agencies, academic staff are allowed to spend a short period in a foreign university, enabling them to acquire and maintain a high level of expertise.

The programme has a standard classroom with up-to-date teaching facilities such as smart display or connected whiteboard unit for lectures and seminars. There is a high-quality Internet facility allowing students to access online pedagogical resources. Facilities are shared within the Department (library) or at the University level (central library and computer room). Common rooms are available for students to work alone or in small groups. The laboratories are equipped with standard and appropriate devices, which benefit not only students, teachers/researchers but also companies wishing to carry out tests in accordance with the standards and

recommendations. However, it appears that some of the equipment needs to be maintained, updated or replaced. Efforts should be made to renew some of this equipment or to increase its number. There are also shared laboratories within the Faculty or at the University level.

A mentoring strategy is in place and offered to new members of staff. Newly recruited academic staff receive coaching to help them acclimate to the University's culture and its missions. They receive informal mentoring from the Head of Department and more experienced colleagues to help them find their way around the Department and its procedures, policies and staff, and to provide advice on career progression. Members of the teaching staff benefit mainly from the Chinese Central South University agreement signed at the University level. Eight have benefited from this mobility scheme. Nine other faculty members acquired postgraduate qualifications abroad.

In the Quality Assurance Policy defined at the University level, all programmes must be assessed. Committees are percolating and exist both at the Faculty and the Department level. This procedure is effectively set in the M.Sc. programme of Civil Engineering at the end of the academic year. A survey is sent to students and to alumni. The responses are forwarded to the Quality Assurance Committee and, after analysis, to the Head of Department. An anonymous and confidential form called the "Student Evaluation Form for Staff and Resources" is also available for evaluating teaching staff and resources. The rating scale ranges from "Poor" to "Excellent". Moreover, the programme is periodically evaluated by means of shadow internal accreditation and external accreditation by the National Universities Commission and professional bodies. There are several bodies at different levels within the institution having with a clear definition of their objectives and membership, which does not include students. Although there is a student union that provides information to the various councils, they are not members.

The students' recruitment procedure is clearly defined in the "Admission Recruitment" section of the Postgraduate Handbook provided by the Department of Civil Engineering. The assessment procedures and the conditions for obtaining the degree are defined and transparent. The evaluation of knowledge follows precise procedures that are common to all the University's M.Sc. programmes and are well described in the University's Quality Assurance system. Students are asked to complete an evaluation survey for all courses. It is stated that a majority of the students are filling the survey, which is analysed at the postgraduate coordinator level. If necessary, a different lecturer can be assigned to a course depending on the results of the survey. Students can also write directly to the Head of Department. The programme has defined and implemented anti-plagiarism for thesis reports and anti-fraud measures for examinations. For instance, the similarity index should not exceed 25% for the dissertation to be acceptable for external examination.

In conclusion, the contributors to the programme have a high level of expertise covering the full scope of the M.Sc. in Civil Engineering programme. The number of teaching, technical and administrative staff is adequate and satisfying. The programme organisation is clearly defined and efficient, and high-level pedagogical resources are available in the department, the faculty or the university. A significant financial contribution would allow for the renewal of specific equipment and provide access to costly simulation software licenses to benefit students and contractors (private companies).

The different procedures for recruitment and examinations are well-detailed and explained in an extensive way in the PG Handbook. Continuous assessment of the courses is performed through a systematic process, and feedback is considered. The integration of newly recruited staff is efficient, in particular with the introduction of a mentoring strategy.

VI. CONCLUSION

The programme of M.Sc. in Civil Engineering is perfectly in line with the University's strategy as well as the socioeconomic needs linked to building constructions and infrastructures. The M.Sc. is integrated and complementary to other programmes of the Faculty of Engineering of the University. Through its curriculum, it addresses the challenges of Constructions in a very comprehensive and engaging manner, while accounting for environmental issues and constraints. The overall programme's organisation is efficient with a high level of pedagogical resources available. The targeted knowledge and skills are well-defined and address main challenges of the socio-economic domain of Constructions. The teaching methods are well-diversified. Interdisciplinary and multidisciplinary are proposed through courses available in other departments of the University. It could be recommended to develop further the acquisition of more information and communication skills.

The programme involved 22 full-time academic members having a very good level of expertise and some of them have very good track-record publications allowing relevant supervision of students. The programme offers the required facilities (equipment, library, software) allowing the students to develop their two years research project. Other national laboratories complement their research needs. The number of teaching staff, technical staff and administrative staff is adequate and satisfying. The different procedures for recruitment and examinations are well detailed and explained in an extensive way in the PG Handbook. Continuous assessment of the courses is performed, this process is systematic, and the feedback is taken into account. The integration of newly recruited staff is efficient, and a mentoring strategy is organised in the Department.

To reach out the objective of training highly skilled M.Sc. students, the programme offers numerous strong links with research and socioeconomic partnerships at the national level. They are well-established through several effective long-standing partnerships with public institutions and private companies, which present a real added value to the programme. It would be interesting to add core courses on ethics and research integrity as well as courses on lifecycle analysis or low-carbon materials. International opportunities are not clearly centralised. Even if partially addressed, additional skills relevant to their job-market integration might be more formally proposed to M.Sc. students.

The attractiveness of the programme is conveniently monitored. The number of applicants is high compared to the available opportunities and 30% to 50% are enrolled. The monitoring is done using a simple and accessible Google form. This survey is also a tool for assessing the M.Sc. programme and results are sent to the Quality Assurance Committee which in turn, gives recommendations to the Department. The labour market integration monitoring highlights a very good integration of the graduates mainly in the economic sector or in Ph.D. programmes, as 91% are currently employed. Modern social media are also used by the programme to stay in contact with graduates.

STRENGTHS

- The attractiveness of the programme and the high number of applications received every year, allowing a selection of the best students
- The very high level of expertise of the academic staff and the adequate number of permanent staff
- The well-monitored job-market integration, showing a high rate of employed graduates, to well-targeted skills and long-standing links with public and private partners
- The sufficient number of available equipment and material resources
- The assessment of the programme and the courses by the students and the analysis of the feedback to enhance the quality of the curriculum

WEAKNESSES

- The limited practical works and case studies offered to students to work on the new challenges faced by companies
- The limited involvement of the external contributors and students in the Department bodies
- The equipment needs to be maintained and/or replaced to train students on up-to-date devices corresponding to the new standards
- The too low number of incoming foreign students
- The high number of not funded students, not even partially, which contributes to an increase in the number of students in the second year of the Master

RECOMMENDATIONS

- Add much more laboratory work and incorporate real-life case studies presented by outside speakers. More professional seminars on new challenges can also be offered. This will make it even easier to prepare graduates to enter the job market and get them up and running in companies more quickly.
- It would be interesting and efficient to further involve external contributors and students in the Department bodies and to open the discussion concerning the curriculum evolution.
- Financial support is needed to maintain and renew the equipment. To this end, it is suggested to apply for more funding by agencies and propose new services to companies.
- A determined policy using modern tools and media (Internet, social media) would make it possible to reach students in foreign countries.
- More financial support is needed to provide scholarships, stipends or research grants to more students. Applying for more funding is highly recommended.

VII. COMMENTS OF THE INSTITUTION



AHMADU BELLO UNIVERSITY **ZARIA, NIGERIA.** **OFFICE OF THE VICE-CHANCELLOR**

Vice-Chancellor: Professor Kabiru Bala, *BSc.(Hons) Building, M.Sc. (Bldg.Serv.), MBA, PhD (Const. Mgt.) (ABU), FNAQB, MAPM, MCABE, C. Bldg E, MICIArb*
VC/REL/43 16 May 2024

Mr. Stephane Le Boulter,
Acting President,
Higher Council for the Evaluation of Research and
Higher Education (HCERES), 2 rue Albert Einstein, 75013 Paris.
France

Dear Sir,

RESPONSE TO OBSERVATIONS FROM INTERNATIONAL GAP ASSESSMENT FOR M.Sc CIVIL ENGINEERING PROGRAMME

I write to acknowledge the gap assessment report on M.Sc. Civil Engineering programme sponsored by Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE), Ahmadu Bello University, Zaria, Nigeria.

The recommendations are well noted and the University administration through the relevant academic organs will ensure that more laboratory works as well as more real-life case-studies which will be presented by outside speakers is included into the training program.

More professional seminars on emerging issues/new challenges within the profession will also be incorporated in the program which will be taught by professionals from the industry.

The curriculum of the program will be upgraded/reviewed with input from industrial partners, alumni, community. Furthermore, courses such as research Ethics, scientific integrity and communication skills will also be incorporated. A mandatory internship for all students with increased duration than the present one-month will be incorporated in the training program.

The ICT policy of the institution will be strengthened so as to make it easier to reach students in foreign countries.

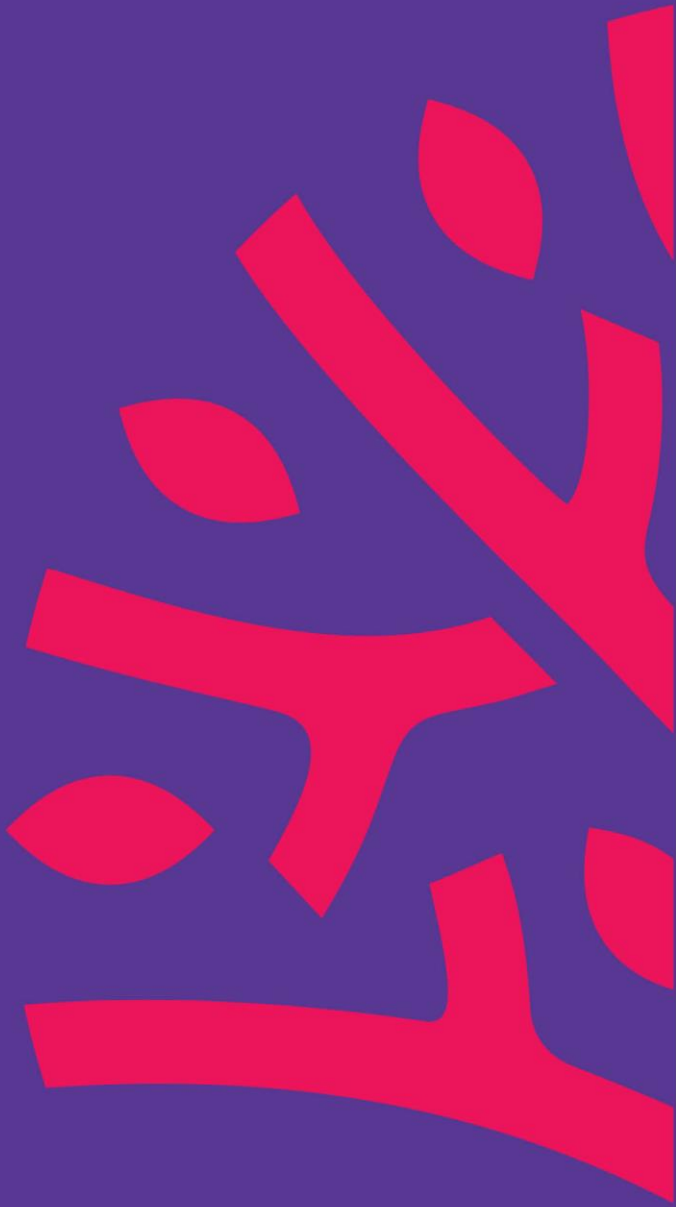
Finally, financial support will be sought from relevant government funding agencies and private sector to provide scholarship and research grants to be able to attract more national and foreign students as well as maintain and purchase new equipment and software's, for training.

Accept my highest regard.

Yours faithfully



Prof. Kabiru Bala
Vice Chancellor



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75013 Paris, France
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ACCREDITATION DECISION

M.Sc. Civil Engineering

Africa Centre of Excellence in New Pedagogies
on Engineering Education (ACENPEE)

Ahmadu Bello University

Zaria, 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-2024-31 on the accreditation of the M.Sc. Civil Engineering, delivered by Ahmadu Bello 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 courses abroad (excluding doctoral/PhD programmes);

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 M.Sc. Civil Engineering delivered by Ahmadu Bello 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: TRAINING POLICY AND CHARACTERISATION

The M.Sc. Civil Engineering is in line with the university's strategy and the socio-economic needs. This M.Sc. is complementary to the other programmes offered by the university's Faculty of Engineering and has been awarded the "African Centre of Excellence" label. The programme tackles the challenges associated with building construction and infrastructure in a comprehensive and engaging manner, with due consideration to environmental concerns. To reach out the objectives, the programme proposes numerous strong links with research and socio-economic partnerships at the national level. To carry on research work, the required facilities (equipment, library, and software) are available within the Department, allowing the students to develop their one-year research project. Other national laboratories complement their research needs, for example in materials characterisation.

The students can pursue a Ph.D. programme in the same Department. It would be interesting to add core courses on ethics and research integrity. Links with socio-economic partners are long-standing and well-established, thanks to several effective partnerships with public institutions and private companies, which add value to the programme. It would be beneficial to engage these partners more actively by having them to contribute to the development of the programme and offer additional professional seminars. MoUs have been signed at the University level, allowing outgoing mobility with foreign universities and international partnerships. Despite the local situation, these international exchanges could be improved, in particular regarding the incoming of foreign students.

ACCREDITATION CRITERION 2: THE PEDAGOGICAL ORGANISATION OF THE STUDY PROGRAMME

The curriculum of the M.Sc. programme is consistent and set in a comprehensive manner. Over a two-year period, on the basis of well-chosen and organised courses, students take the core and elective courses required for building and infrastructure construction. Interdisciplinarity and multidisciplinary are proposed through courses available in other Departments of the University. The knowledge and skills are well-defined and address the main challenges of the socio-economic domain of Constructions. The teaching methods are well diversified. It is recommended for the acquisition of information and communication skills to be further developed.

A one-month work placement is only compulsory for students on the ACENPEE programme, which is a second stage of professional immersion. It appears actually that all students have already completed a six-month work placement during the B.Sc. programme. A one-year research project combining practical and theoretical work is proposed. Students are strategically connected with socio-economic partners.

They only have access to international opportunities through social networks and communication with alumni, although a holistic approach is taken by the Policy Assurance Committee at the university level. In addition, even if they are partially addressed, additional skills useful for their integration into the labour market could be more formally offered to M.Sc. students.

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

The attractiveness of the programme is conveniently monitored. The number of applicants is high compared to the available opportunities. The choice has been made to remain selective in recruiting students, with 30 to 50% enrolled to take account of capacity and the availability of supervisors. The monitoring is done using a simple and accessible Google form. This survey is also a tool for evaluating the M.Sc. programme, and the results are sent to the Quality Assurance Committee, which makes recommendations to the Department. Monitoring job market integration shows that graduates are very well integrated, with 91% employed, mainly in the business sector or doctoral programmes. Modern social media are also used by the programme to stay in contact with graduates.

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

The contributors to the programme have a high level of expertise covering the full scope of the M.Sc. in Civil Engineering programme. The number of teaching, technical and administrative staff is adequate and satisfying. The programme organisation is clearly defined and efficient, and high-level pedagogical resources are available in the department, the faculty or the university. A significant financial contribution would allow for the renewal of specific equipment and provide access to costly simulation software licenses to benefit students and contractors (private companies).

The different procedures for recruitment and examinations are well-detailed and explained in an extensive way in the PG Handbook. Continuous assessment of the courses is performed through a systematic process, and feedback is considered. The integration of newly recruited staff is efficient, in particular with the introduction of a mentoring strategy.

Article 2

The M.Sc. Civil Engineering delivered by Ahmadu Bello University in Nigeria, is accredited for a period of five years from the date of this decision.

Article 3

The decision is accompanied by the following recommendations and comments:

- Add much more laboratory work and incorporate real-life case studies presented by outside speakers. More professional seminars on new challenges can also be offered. This will make it even easier to prepare graduates to enter the job market and get them up and running in companies more quickly.
- It would be interesting and efficient to further involve external contributors and students in the Department bodies and to open the discussion concerning the curriculum evolution.
- Financial support is needed to maintain and renew the equipment. To this end, it is suggested to apply for more funding by agencies and propose new services to companies.
- A determined policy using modern tools and media (Internet, social media) would make it possible to reach students in foreign countries.
- More financial support is needed to provide scholarships, stipends or research grants to more students. Applying for more funding is highly recommended.



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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