

**A3ES**

Agência de Avaliação  
e Acreditação  
do Ensino Superior

## **Program Review Report**

### **Master of Science Programme in Civil Engineering**

**University of Macau**

**Faculty of Science and Technology**

**Department of Civil and Environmental Engineering**

### **Cluster Programme Review of:**

**Master of Science Programme in Civil Engineering**

**&**

**Doctor of Philosophy Programme in Civil Engineering**

**Agência de Avaliação e Acreditação do Ensino Superior - A3ES**  
**(Agency for Assessment and Accreditation of Higher Education)**

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### **Abbreviations**

A3ES:	Agência de Avaliação e Acreditação do Ensino Superior
BSc:	Bachelor of Science (programme or degree)
CE	Civil Engineering
CEE:	Civil and Environmental Engineering
CV:	Curriculum vitae
DCEE:	Department of Civil Engineering
DSES	Higher Education Bureau of the Government of Macao Special Administrative Region
FST:	Faculty of Science and Technology
HEE:	Hydraulics and Environmental Engineering
MPhi	Master of Philosophy
MSc:	Master of Science (programme or degree)
PEO:	Programme Educational Objectives
PhD:	Doctor of Philosophy (programme or degree)
PO:	Programme outcomes
QA:	Quality Assurance
SED:	Self-Evaluation Document
SGE:	Structural and Geotechnical Engineering
UM:	University of Macau

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## Basic Information of Programme

*Name of the Higher Education Institution:* University of Macau

*Host Academic Unit:* Faculty of Science and Technology,  
Department of Civil and Environmental  
Engineering

*Name of the Programme:* Master of Science Programme in Civil  
Engineering

*Degree Level:* Master of Science (MSc)

*Major Mode of Delivery:* Full-time

*Major Language of Instruction:* English

*Commencing Year:* 1993

*Maximum Enrolment:* Around 15-17 for each specialization

## Executive Summary

This document concerns the review of the Master of Science Programme in Civil Engineering carried out by the Agência de Avaliação e Acreditação do Ensino Superior - A3ES (Agency for Assessment and Accreditation of Higher Education), according to the "Guidelines on Program Review" and the "Guidelines for External Quality Assurance Agencies", which were compiled by the Higher Education Bureau (DSES) of the Government of Macao Special Administrative Region.

The assessment exercise was based on the Self-Evaluation Document (SED) received by A3ES in October 2019.

On November 08, 2019, the Panel had the Preparatory Meeting. It was decided to ask for the following documents/additional clarifications:

- Supplementary Information I: sample representative of the exams;
- Supplementary Information II: updated CV of the academic staff of the Department of Civil and Environmental Engineering, and;
- Supplementary Information III: Link to download the dissertations representative of the different fields.

The objectives of the Master of Science Programme in Civil Engineering are clearly defined and the expected roles and functions of the staff and of the graduates are well stated. It intends to provide the Civil Engineering skills to prepare graduates to pursue careers in related research, academy, industries or government bodies. The graduates are trained to be able to appropriately identify, formulate and solve complex civil engineering problems in research or practical fields, as well as being creative and innovative, together with capacity of oral and written communications. The results of postgraduate students and alumni survey show, in terms of programme outcome and employment, that the PEOs are satisfactory met.

The creation of two parallel degrees was proposed: (1) Master of Philosophy (MPhil) in Civil Engineering (corresponding to the existing degree) and (2) Master of Science (MSc) in Civil Engineering. The main difference is that the Thesis is not compulsory in the MSc degree. Even though this proposal is positive in various aspects, it is not clear whether the coursework is different in the future MPhil and MSc.

In what concerns admission requirements and selection process, it was concluded that the DCEE has, in general, well-established and correct procedures and criteria. However, the process of ranking the applicants is not clearly described, namely to take into account a potential situation of the number of applicants being higher than the number of vacancies.

Despite the efforts of DCEE, it was identified that the number of students enrolled after 2014/2015, per year, varies between 14 and 27, i.e. well below the offered vacancies in some years, particularly in the HEE degree. However, it can be expected that the newly established Postgraduate Assistantship, the Center for Regional Ocean,

as well as the State Key Laboratory of Internet of Things for Smart City established in 2018, will boost the capture of excellent students in the world to pursue their MSc studies in the UM.

As far as professional recognition is concerned, the information in the postgraduate student and alumni survey shows that the 65 graduates of the programme in the last 9 years work in various areas (with emphasis on Government, Engineering Firms and Education), and, more significantly, they are evenly distributed between design, construction, and management.

However, it was identified that some students completed their degree in 6 years or more, which means that it can be argued that there is some room for improvement in "time to graduation", even though more recently a good number of students succeeded to graduate in 3 or fewer years.

The programme structure and content prepared by the academic staff is a result of the participation of several players, such as internal and external stakeholders, as well as comments from employers and graduates coming from the survey and meetings. This is a very good approach and allows the study programme to be regularly reviewed and updated. However, a more detailed analysis of the content of the courses identified some drawbacks and recommends improvements.

The assessment to deliver the degree of Master of Science in Civil Engineering follows the well-established international rules.

The academic staff is well qualified with proper scientific skills to teach the study programme and to conduct research projects on Civil Engineering.

The Panel supports the claim of material and human resources for new research laboratories, and expects that this will be implemented with the installation of the State Key Laboratory of Internet of Things for Smart City approved by the Ministry of Science and Technology in 2018. It is foreseen that the DCEE will give priority to the opportunities of new research projects embracing topics like Smart Transportation, Smart Project Management, among others. It is expected that this will attract students for the programme and it will be a challenge for the DCEE, among other courses.

There are no doubts that the DCEE has in place sound internal quality assurance mechanisms, enabling the Department Head, the Programme Leader and other responsible academic staff, to monitor, manage, and improve continuously the study programme.

The Panel encourages the DCEE to implement the improvement actions referred above.