

PROGRAMME STANDARDS GEOLOGY



**FIRST EDITION
2026**

Programme Standards: Geology

First Edition: 2026

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FOREWORD

Geology is a cornerstone of national development, underpinning essential sectors such as mineral exploration, environmental management, infrastructure planning, water resources, and disaster risk reduction. As Malaysia accelerates towards achieving its long-term environmental and economic aspirations, the need for competent, ethical, and globally relevant geologists has never been more pressing. It is within this context that the Programme Standards: Geology has been developed to ensure that academic programmes in geology across the country are aligned with national goals, international best practices, and the rapid evolution of geoscientific knowledge and technologies.

This document serves as a foundational guide for higher education providers in Malaysia, offering a structured framework for the design, implementation, assessment, and continual enhancement of geology programmes at the undergraduate levels. Anchored in the Malaysian Qualifications Framework (MQF), it emphasizes not only academic excellence and disciplinary depth, but also professional ethics, sustainability, and interdisciplinary collaboration.

The standards outlined herein reflect a consensus among key stakeholders including academics, professional geologists, industry leaders, and regulatory bodies on the core competencies and attributes expected of graduates in the field. They aim to foster graduates who are not only technically proficient, but also critical thinkers, problem-solvers, and responsible stewards of Earth's resources and environments.

The Board of Geologists Malaysia (BoG), established under the Geologists Act 2008 (Act 689), is committed to upholding the integrity and advancement of the geology profession. By endorsing this first edition of the Programme Standards: Geology, BoG reaffirms its mandate to promote educational excellence and safeguard the quality of geological practice in Malaysia. It is our hope that this document will empower academic institutions to develop robust, forward-looking programmes that produce graduates equipped to serve the needs of the nation and the global community.

On behalf of the Board, I extend my sincere appreciation to all contributors and stakeholders who have shared their expertise, insights, and time in the formulation of this standard. Your dedication ensures that the next generation of Malaysian geologists will be well-prepared to face the complex challenges of the 21st century.

Let this document be both a benchmark and a living reference one that evolves in tandem with the growing demands of the geological profession and the dynamic nature of our Earth.

Thank you.

A handwritten signature in black ink, slanted upwards from left to right, with a small loop at the end.

DATUK P.GEOL. ZAMRI BIN RAMLI (FIGM)

Chairman

Board of Geologists (BoG)

2026

ABBREVIATIONS

AAS	Atomic Absorption Spectroscopy
BoG	Board of Geologists Malaysia
BOK	Body of Knowledge
CEFR	Common European Framework of Reference for Languages
CGPA	Cumulative Grade Point Average
COPIA	Code of Practice for Institutional Audit
COPPA	Code of Practice for Programme Accreditation
COPPA: ODL	Code of Practice for Programme Accreditation: Open and Distance Learning
COPTPA	Code of Practice for TVET Programme Accreditation
CPD	Continuous Professional Development
ESD	Education for Sustainable Development
FLP	Flexible Learning Pathways
GGP	Guidelines to Good Practices
GIS	Geographic Information System
GPA	Grade Point Average
GPS	Global Positioning System
GSA	Global Sustainability Agenda
HEP	Higher Education Provider
ICP	Inductively Coupled Plasma
JPT	Jabatan Pendidikan Tinggi
JSPG	Jawatankuasa Standard Program Geologi

LOD	Learning Outcome Domain
MOHE	Ministry of Higher Education
MUET	Malaysian University English Test
MQA	Malaysian Qualifications Agency
MQF	Malaysian Qualifications Framework
PEO	Programme Educational Objective
PLO	Programme Learning Outcome
PS	Programme Standards
QA	Quality Assurance
SKM	Sijil Kemahiran Malaysia
SPM	Sijil Pelajaran Malaysia
STAM	Sijil Tinggi Agama Malaysia
STPM	Sijil Tinggi Persekolahan Malaysia
TVET	Technical and Vocational Education and Training
UCS	Uniaxial Compressive Strength
VBE	Value-Based Education
XRD	X-ray Diffractometer
XRF	X-ray Fluorescence
WBL	Work-based Learning

1. INTRODUCTION

Geology is the scientific study of the Earth, including its structure, composition, processes, and history. It involves examining how the Earth was formed, how it changes over time, and how its materials such as rocks, minerals, and fossils reveal information about past environments and life. Key areas of geology include Earth systems, Earth materials, Earth processes, Earth history, and geological techniques and applications. The document covers the Bachelor's Degree Programme (Level 6, MQF).

Geologists work to understand natural hazards (such as earthquakes and landslides), explore natural resources (such as oil, gas, minerals and groundwater), and study climate change and environmental impacts over geological time. Geology graduates may work in either the public or private sector, including government agencies, universities and research institutions, mining and energy companies, environmental and engineering consultants, as well as non-governmental and international organizations.

The Board of Geologists Malaysia (BoG) is the statutory body established under the Geologists Act 2008 (Act 689) to regulate and oversee the practice of geology in Malaysia. Its primary responsibilities include registering geologists, ensuring compliance with professional standards, and promoting the advancement of the geology profession in the country.

In accordance with BoG regulations, a standard programme for geological education should be established. The Programme Standard outlines the minimum requirements that must be met by Higher Education Providers (HEPs) in designing curriculum, admitting students, recruiting academic staff, and providing infrastructure and appropriate learning resources to ensure a sound quality management system. Emphasis is placed on the Outcome-Based Education (OBE) approach in undergraduate training. This document was developed by comparing the geology

programs offered by public and private universities in Malaysia, the Geologists Act 2008 (Act 689), and international benchmarks, including the Quality Assurance Agency (QAA) for Higher Education (UK) and the Geological Society of London (GSL) accreditation for Geoscience Degree Programmes.

The document was formulated through a series of workshops with the *Pasukan Petugas Pembangunan Standard Program Geologi* and *Jawatankuasa Standard Program Geologi* (JSPG) (**Appendix 1**) and other stakeholders (**Appendix 2**), whereas the Body of Knowledge (BOK) are listed in **Appendix 3**. The document should be read in conjunction with other quality assurance documents and policies issued by the Malaysian Qualifications Agency (MQA) and other relevant authorities.

2. PROGRAMME DEVELOPMENT AND DELIVERY

2.1 PROGRAMME EDUCATIONAL OBJECTIVES

Programme Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that the programme is preparing students to achieve after they graduate.

“The quality of a programme is ultimately assessed by the ability of its graduates to carry out their expected roles and responsibilities in society. This requires the programme to have a clear statement of the competencies, which are the practical, intellectual and soft skills expected to be achieved by the students at the end of the programme” (COPPA 2nd Edition, 2017).

Guidance on Programme Educational Objectives (PEOs) is provided, while the flexibility to describe the PEOs remains with the Higher Education Providers (HEPs). However, it is crucial that these objectives align with the institution's vision and mission. It is important to note that the provided PEOs outline minimum requirements and as a guide. The PEO statements need to be formulated to connect the institution's educational goals to the Programme Learning Outcomes (PLOs).

At the programme level, HEPs can utilize a PEO-PLO (Programme Educational Objectives-Programme Learning Outcomes) mapping approach. This ensures that each PEO is directly linked to the relevant PLOs. By explicitly mapping PEOs and PLOs, HEPs can later correlate PEO achievements with PLO measurements using appropriate statistical tools. For further guidance on this mapping process, please refer to the Guidelines to Good Practices: Programme Design and Delivery (2023) section 2.4, which elucidates the relationship between Programme Educational Objectives and Learning Outcomes.

The PEOs of the Bachelor's Degree Programme (Level 6, MQF) are outlined in Table 2.1 below:

Table 2.1: Programme Educational Objectives (PEOs) of the Bachelor's Degree Programme (Level 6, MQF)

	Bachelor's Degree Programme (Level 6, MQF)
PEO1 (knowledge, understanding, cognitive)	The geologist exhibits in-depth knowledge in geology and related disciplines, and can provide evidence-based solutions to geological and industry-related challenges.
PEO2 (practical, numerical, digital)	The geologist adopts relevant procedures and practical skills, utilizing digital technologies and quantitative information for effective decision-making in geology and related fields.
PEO3 (leadership, communication, interpersonal)	The geologist leads collaborations with others as an effective leader and communicates information professionally to stakeholders.
PEO4 (personal, ethical, professionalism, entrepreneur)	The geologist adheres to ethical, social, cultural, and professional codes of practice, while demonstrating innovative and entrepreneurial initiatives in the geological and related professions.

2.2 PROGRAMME LEARNING OUTCOMES

Learning Outcomes (LO) or Programme Learning Outcomes (PLO) are detailed statements describing the learners' achievement in explicit terms, and they are achievable and assessable upon the completion of a period of study.

“A programme is designed and delivered to facilitate the attainment of a set of desired learning outcomes. It starts with a clear definition of the intended outcomes that students are to achieve by the end of the programme and supported by appropriate instructional approaches and assessment mechanisms.” (COPPA 2nd Edition, 2017).

The learning outcomes in the Bachelor's Degree Programme **cumulatively reflect the five (5) clusters¹ of learning outcomes** aimed to develop well-balanced individuals with a holistic set of competencies.

The five (5) clusters of learning outcomes are:

1. Knowledge and understanding
2. Cognitive skills
3. Functional work skills, with focuses on:
 - a. Practical skills
 - b. Interpersonal skills
 - c. Communication skills
 - d. Digital skills
 - e. Numeracy skills
 - f. Leadership, autonomy, and responsibility
4. Personal and entrepreneurial skills
5. Ethics and professionalism

¹ Malaysian Qualifications Agency (2017). Malaysian Qualifications Framework 2nd Edition. Cyberjaya, Malaysia.

Table 2.2 shows the mapping of learning outcomes based on the MQF learning outcomes for Bachelor's Degree Programme. **The flexibility in describing the learning outcomes remains with the HEPs, provided they are sufficiently covered.**

Table 2.2: Programme Learning Outcomes (PLO) based on MQF 2.0's Learning Outcomes (LO) for Bachelor's Degree Programme (Level 6, MQF)

BACHELOR'S DEGREE PROGRAMME (LEVEL 6, MQF)

At the end of the programme, graduates will be able to:

PLO	MQF 2.0										
	1	2	3	4	5	6	7	8	9	10	11
Explain in-depth knowledge of geology and associated disciplines in both national and international contexts. (C4)	*										
Correlate relevant principles, theories and models for effective solutions and decisions within geology and associated disciplines. (C4)		*									
Integrate practical-related work skills in professional activities within the geology and associated disciplines. (P4)			*								
Organize collaborative teamwork effectively with diverse stakeholders in various social, cultural and relational situations. (A4)				*							
Relate geological ideas verbally and non-verbally to diverse audiences in various contexts. (A4)					*						

PLO	MQF 2.0										
	1	2	3	4	5	6	7	8	9	10	11
Exhibit the application of digital/information technologies in various contexts within the geology and associated disciplines. (A3)						*					
Analyze quantitative geological and related information for effective solutions and decisions within the geology and associated disciplines. (C4)							*				
Demonstrate leadership qualities and autonomy within the geology and associated professions. (A4)								*			
Prioritise lifelong learning skills for personal development within the geology and associated disciplines. (A4)									*		
Adopt entrepreneurial skills and knowledge for innovative ventures within the geology and associated disciplines. (A3)										*	
Adapt ethical, social, cultural and professional codes of practice into decision-making within the geology and associated disciplines. (A4)											*

1-Knowledge and Understanding; 2-Cognitive Skills; 3-Practical Skills; 4-Interpersonal Skills; 5-Communication Skills; 6-Digital Skills; 7-Numeracy Skills; 8-Leadership, Autonomy and Responsibility; 9-Personal Skills; 10-Entrepreneurial Skills; 11-Ethics and Professionalism.

Notes:

1. The total number of PLOs does not have to be eleven (11), but they must align with all Malaysian Qualifications Framework Learning Outcome Domain (LOD) and be mapped clearly.
2. The PEOs and PLOs have been mapped using comprehensive insights from leading economic research organizations and reports on the future of work. These sources analyse global workforce trends, technological advancements, industry changes and essential skills, illustrating how automation, digital transformation, demographic shifts and economic changes shape future jobs globally and in Malaysia. This alignment ensures that our PEOs and PLOs effectively meet current and future employment demands.

2.3 CURRICULUM DESIGN AND DELIVERY

A well-designed curriculum² is fundamental to quality education, ensuring that graduates are equipped with relevant knowledge and skills. Learning and teaching can only be effective when the curriculum content and the programme structure are kept abreast with the most current development in its field of study (COPPA 2nd Edition, 2017, p.8).

A formal curriculum is defined as a series of planned events that are intended to have educational outcomes. It plans a sequence in which the content of a particular programme is delivered, whether through conventional or non-conventional modes and the books and materials that are to be used.

It also lays down the educational objectives and learning outcomes of the programme (Guidelines to Good Practices: Programme Development and Delivery, 2023, p.29). HEPs also need to ensure the curriculum content, and the programme reflects the VBE and ESD competencies, incorporating the GSA and FLPs.

This section outlines the minimum credit requirements for each curriculum component of the Bachelor's Degree Programme. Specific requirements for the Body of Knowledge (BOK) in the common core are summarised in Appendix 3. These cover key areas in geology, including Earth systems, Earth materials, Earth processes, Earth history, and geological techniques and applications. A given BOK component may be delivered either as individual topics or as a stand-alone course, provided that the core areas of the programme are adequately addressed. Notably, regardless of the programme structure, all common core components must be covered in accordance with the requirements outlined in Table 2.3. Higher Education Providers (HEPs) retain the flexibility to design their own programmes.

² Standards in this area are best read together with the Guidelines to Good Practices: Curriculum Design and Delivery, which is available on the MQA Portal: www.mqa.gov.my.

In addition, HEPs are encouraged to develop their programmes to reflect current best practices and to offer high-quality academic experiences. The BOK in the Discipline Core should reflect the strengths of the degree offered by each HEP. These areas may be geological or non-geological fields relevant to the programme. While general programmes may vary in their nomenclature, the programme title must accurately reflect its content, as indicated in the MQF.

Table 2.3: Minimum credits of each curriculum component for Bachelor's Degree Programme

BACHELOR'S DEGREE PROGRAMME (LEVEL 6, MQF)

Components	Minimum Credits
Compulsory Modules (General* and HEP modules)	8
Common Core Geology Courses**	30
Discipline Core Courses*** (can include non-geology courses based on need of programme)	30
Project	6
Industrial Training****	6
Field Elective	0
Free Electives*****	0
Sub Total Credit	80
To complete the minimum requirement of 120 credits, the remaining 40 credits can be placed in any of the category above.	
MINIMUM GRADUATING CREDIT	120

Notes:

1. *Compulsory Modules refer to Mata Pelajaran Pengajian Umum (MPU) courses, which are mandatory. Please refer to Garis Panduan Mata Pelajaran Pengajian Umum (MPU) Edisi Kedua for the minimum credit requirement as stipulated by

the Ministry of Higher Education (MOHE). The HEP has the option to offer its own compulsory courses in addition to the general courses.

2. ** Common Core Geology Courses refer to courses that cover the Body of Knowledge (BOK) outlined in Appendix 3.
3. *** Discipline Core Courses refer to both geology and non-geology courses, with a minimum of 18 credits in geology-related fields.
4. **** Industrial training must be in a relevant industry and is allocated at a minimum number according to the formula of 1 credit = 2 weeks of training. It is suggested to be placed during the final semester.
5. ***** Free electives are non-geology related courses. Flexibility is given to HEPs to determine the appropriate credit.

The distribution of credits in academic programmes within this programme standard is guided by a principle rooted in flexibility and adherence to minimum requirements. Aligning closely with current and projected industry requirements, the credit distributions ensure that graduates are well-prepared for employment and poised to make meaningful contributions from day one in the field of geology. Any remaining credits can be strategically allocated within specified categories to fulfil the minimum requirements, granting autonomy to shape the programme's direction. This approach enhances flexibility and maintains adherence to essential benchmarks, empowering educators to effectively tailor programmes to meet diverse educational goals and evolving industry demands.

Engaging in a well-crafted learning and teaching activity allows students to collaborate with a facilitator, acquiring the essential knowledge and skills to meet their learning outcomes. Selecting the most effective delivery method transforms instruction into a dynamic and immersive experience, inspiring students to actively participate with the content and enhance their knowledge and skills. For a comprehensive list of learning and teaching activities, please refer to Appendix 5 in

the Guidelines to Good Practices: Programme Design and Delivery, 2nd Edition (2023).

3. ASSESSMENT OF STUDENT LEARNING

“Assessment of student learning³ is a key aspect of quality assurance, and it is one of the most important indicators of learning outcomes achievement. Hence, it is crucial that appropriate assessment methods and mechanisms are in place. Qualifications are awarded based on the results of assessment. The methods of the student assessment must be aligned, clear, consistent, effective, reliable, and in line with current practices. They must clearly measure the achievement of the intended learning outcomes” (COPPA 2nd Edition, 2017).

The methods of assessment depend on the specific requirements of each course. Nonetheless, the following must be considered as a general guide:

- i. Assessments should comprise formative and summative assessments;
- ii. Assessment must be aligned to both course and programme learning outcome;
- iii. The development of intended programme learning outcomes (PLOs) should occur progressively, with courses at different stages of the programme indicating the progression (Table 3 COPPA 2, GGP PDD item 36 & 37). Consequently, it is essential to clearly identify and indicate courses that enable, enforce, reinforce, and measure PLOs. The achievement of PLOs at each stage should be compared to the performance targets set (COPPA 2.1.2). Intervention should be considered in cases where the performance target is not met;
- iv. Assessment of students' intended course learning outcomes may comprise both continuous and final assessments. Candidates must achieve a pass in

³ Standards in this area are best read together with the Guidelines to Good Practices: Assessment of Students, which is available on the MQA Portal: www.mqa.gov.my.

either their continuous or final assessments. Higher Education Providers (HEPs) can define the meaning of a pass; however, it should imply that the examiner is satisfied that the candidate has met all the learning outcomes of a course;

- v. Individual and group components for course assessment should be considered in an assessment plan. In courses without a final examination, the weightage of the individual component shall be determined by the programme owner;
- vi. The HEP must ensure academic integrity is adhered especially when generative artificial intelligence is incorporated in students' assessment. Consequently, alternative and authentic assessment should be considered and practiced; and
- vii. The HEP must have clear marking guidelines such as assessment rubrics, marking schemes, and others for continuous and final assessments to indicate the achievement of course learning outcomes and the assigned programme learning outcome.

The percentages of continuous and final assessments for a course at each level of study are presented in Table 3 as an example. The HEP has the autonomy to decide on appropriate percentages for continuous and final assessments, with justification. The suggested forms of assessments indicated are merely examples. HEPs are encouraged to use various methods and tools suitable for measuring learning outcomes and competencies. The selection of assessment methods must be related and relevant to the programme delivery and offering mode chosen by the programme owner.

Table 3: Type of assessment for the Bachelor's Degree Programme

LEVEL	CONTINUOUS ASSESSMENT (%)	FINAL ASSESSMENT (%)	SUGGESTED FORMS OF ASSESSMENT
Bachelor's Degree Programme (Level 6, MQF)	30 – 100	0 – 70	• Case Study • Colloquium • Comprehensive Examination • Course Product • Course Project • Critique and Review • Demonstration • Dissertation • Essay • Event Management • Examination • Exhibition • Expert-based Assessment (Academic & Industry) • Field Work • Final Year Project • Seminar • Internship Report • Logbook • Oral Presentation • Peer Assessment • Portfolio or e-portfolio • Project Proposal • Proposal Defence • Quiz • Reflective Report • Research Project • Research Proposal • Simulation • Test • Thesis/Dissertation • Virtual Online Assessment • Viva voce • Workshop

Notes:

- i. Standards in this area are best read together with the Guidelines to Good Practices: Assessment of Students, which is available on the MQA Portal: www.mqa.gov.my.
- ii. The robustness and security of the processes and procedures related to student assessment are crucial in inspiring confidence in the quality of the qualifications awarded by the HEP. Please refer to section 3.2.3, Management of Student Assessment, in the Code of Practice for Programme Accreditation, 2nd Edition (2017) for more details.

4. STUDENT SELECTION

This section of the PS relates to the selection of students for programmes of study.

“In general, admission to a programme needs to comply with the prevailing policies of the Ministry of Higher Education (MOHE). There are varying views on the best method of student’s selection. Whatever method is used, the HEP must be able to defend the consistency of the method it utilises. The number of students to be admitted to a programme is determined by the capacity of the HEP and the number of qualified applicants. HEP admission and retention policies must not be compromised for the sole purpose of maintaining the desired enrolment. If a HEP operates geographically separated campuses or if the programme is a collaborative one, the selection and assignment of all students must be consistent with national policies.” (COPPA 2nd Edition, 2017).

The standards for the selection of students into programmes within this programme standard (PS) are formulated by keeping in mind the generic national higher education policies pertaining to minimum student entry requirements.

The minimum entry requirements are shown in Table 4.

Table 4: Minimum Entry Requirement for Student Admission

LEVEL	ENTRY REQUIREMENT	ENGLISH COMPETENCY REQUIREMENT (INTERNATIONAL STUDENT)
BACHELOR'S DEGREE PROGRAMME (LEVEL 6, MQF)	Achieve minimum of Band 2 <i>Malaysian University English Test</i> (MUET) AND (i) A pass in <i>Sijil Tinggi Persekolahan Malaysia</i> (STPM) or its equivalent, with a minimum of Grade C in TWO (2) subjects (GPA 2.00) in: • Biology • Physics • Chemistry • Mathematics (T)/ • Mathematics (M) • Geografi OR (ii) A pass in <i>Sijil Tinggi Agama Malaysia</i> (STAM) with a minimum grade of Jayyid with a minimum of Grade C in TWO (2) subjects (GPA 2.00) in: • Biology • Physics • Chemistry • Mathematics (T)/ • Mathematics (M) • Geografi OR (iii) A Diploma in Science or Engineering, or its equivalent, with a minimum CGPA of 2.50;	Achieve (MUET) or any English competency test equivalent to a High B1 Common European Framework of Reference (CEFR). English competency requirement refer to <i>Surat Pemakluman JPT berkenaan Syarat Kompetensi Bahasa Inggeris kepada Pelajar Universiti Awam</i> (JPT(A) 1000/016/018/07 Jld. 17(12)) and <i>Institusi Pendidikan Tinggi Swasta</i> (JPT/GS 1000/630 Jld. 3(12)) dated 6th March 2023.

LEVEL	ENTRY REQUIREMENT	ENGLISH COMPETENCY REQUIREMENT (INTERNATIONAL STUDENT)
	OR (iv) Matriculation/Foundation or its equivalent, a minimum of Grade C in TWO (2) subjects (CGPA 2.00) in: • Biology • Physics/Engineering Physics • Chemistry/Engineering Chemistry • Mathematics OR (v) <i>Diploma Kemahiran Malaysia (DKM) / Diploma Vokasional Malaysia (DVM)</i> with a minimum CGPA of 2.50 subjected to HEP Senate / Academic Board's approval; OR (vi) <i>Diploma Lanjutan Kemahiran Malaysia (DLKM)</i> with a minimum CGPA of 2.50 subjected to HEP Senate / Academic Board's approval; OR (vii) <i>Certificate of Accreditation Of Prior Experiential Learning (APEL.A)</i> with Level 6 MQF; OR (viii) <i>Other relevant and equivalent qualifications recognised by the Malaysian Government.</i>	

Notes:

- i. Refer to Surat JPT GS 1000/630 Jld 3 (12) 6th March 2023 – *Syarat Kompetensi Bahasa Inggeris Kepada Pelajar Antarabangsa* for equivalent English language assessments and scores.
- ii. For Public Universities, refer to Surat JPT.S(BPKP)2000/400/04/01 Jld.5(53), 20th November, 2019 - *Pindaan syarat kelayakan minimum (Syarat am) Diploma TVET (DKM, DLKM, DVM) sebagai syarat kelayakan masuk ke program Ijazah Sarjana Muda di Universiti Awam (UA)*.
- iii. For Private Higher Educational Institutions: Refer to Surat JPT/GS 1000-606 Jld. 2(23), 21st April, 2020 - *Kemasukan Pelajar Lulusan Diploma Kemahiran Malaysia (DKM), Diploma Lanjutan Kemahiran Malaysia (DLKM) dan Diploma Vokasional Malaysia (DVM) ke Peringkat Sarjana Muda (Tahap 6 MQF) atau yang setara dengannya di Institusi Pendidikan Tinggi Swasta*.

Accreditation of Prior Experiential Learning for Access

Accreditation of Prior Experiential Learning for Access (APEL.A) provides an alternative entry route to formal programmes of study from Certificate (Level 3, MQF) to Doctoral degree (Level 8, MQF) through recognition of learning and experiences, regardless of how and where they were acquired. For details, refer to the Guidelines to Good Practices: Accreditation of Prior Experiential Learning for Access (APEL.A) and Accreditation of Prior Experiential Learning for Micro-credentials (APEL.M).

5. ACADEMIC STAFF

“As the quality of the academic staff⁴ is one of the most important components in assuring the quality of higher education, a HEP is expected to search for and appoint the best-suited candidates, to serve its programmes, in an open, transparent and fair manner. To achieve this, HEPs are expected to design and implement an academic staff search and recruitment practice that is as efficient as it is effective to achieve the desired results. Every programme must have an appropriately qualified and sufficient number of academic staff, working in a conducive environment that attracts talented individuals. The numbers recruited have to be adequate for, and appropriate to, the needs of the programmes. The role of the academic staff in various activities has to be clarified in order to reflect a fair distribution of responsibilities. It is important for the HEP to provide a continuous staff development programme for its academic staff, for them to be current in their knowledge and skills, both in their chosen discipline as well as in their pedagogical skills.” (COPPA 2nd Edition, 2017).

Table 5 provides the minimum requirements of the qualifications of academic staff and relevant staff ratios for the various MQF qualification levels. Besides possessing qualifications in the related field, HEPs must also ensure that academic staff are assigned courses based on their areas of expertise or relevant industry experience.

⁴ Standards in this area are best read together with the Guidelines to Good Practices: Academic Staff and the Guidelines: Academic Staff Workload, which are available on the MQA Portal, www.mqa.gov.my.

Table 5: Qualification requirement of academic staff

MQF LEVEL	MINIMUM REQUIREMENT	NOTE
BACHELOR'S DEGREE PROGRAMME (LEVEL 6, MQF)	- A Master's Degree (Level 7, MQF) in Geology and related field; OR - A Bachelor (Level 4, MQF) in Geology or related field AND at least TEN (10) years of industry experience in a related field at a supervisory level in the subject taught AND a registered geologist with the Board of Geologists Malaysia. (the programme should not employ more than 30% of staff in this category).	- At least 50% of the lecturers teaching geology courses are registered geologist with the Board of Geologists Malaysia. - At least 60% of the academic staff are full-timers. - Part-time staff may consist of industry practitioners or from academia. - At least 20% of the staff (both full time and part time) are required to have industry experience/ attachment in a relevant field. Staff-student ratio - Overall staff-student ratio maximum – 1:20

Notes:

- i. A candidate without a Bachelor's degree (Level 6, MQF) but with a Master's degree (Level 7, MQF) obtained through the APEL.A route may be accepted as academic staff by considering the related industry experience gained.
- ii. Experience can be cumulative experience even before acquiring the required qualification for a particular level of study, however, it must be related to the level and content of the study.
- iii. The staff (instructor/facilitator/tutor) to student ratio for the Open and Distance Learning (ODL) programme must be suitable for the learning-teaching methods and adhere to the discipline, while also considering the uniqueness and flexibility of ODL. Please refer to the Code of Practice for Programme Accreditation: ODL

(COPPA: ODL) for more details.

- iv. Please refer to *Surat Makluman MQA Bil. 7/2014 – Garis Panduan Beban Staf Akademik* for general guidelines on staff workload and staff-student ratio. You may utilize either the staff-student ratio framework outlined previously or the one provided in *Surat Makluman MQA Bil. 7/2014 – Garis Panduan Beban Staf Akademik*.

Academic Staff Development

In order to deliver quality programmes and produce marketable graduates, competent qualified academic staff must be employed. Hence, HEPs must ensure that the academic qualifications of their academic staff are accredited by the relevant accreditation bodies. It would also be an advantage for the HEPs to hire those with certain years of working experience to reflect on their intellectual maturity and enrich the learning experience of the students.

The HEPs must commit to providing staff with development opportunities to ensure that their staff are able to contribute fully to their vision and mission. Therefore, the **HEPs must provide the academic staff with at least 40 hours per year of Continuous Professional Development (CPD) programmes** to enhance their expertise and skills in pedagogy for teaching, learning, assessment, research, technology literacy and current trends. The CPD may include participating in training, workshops and conferences; pursuing academic/professional qualifications; engaging in self-directed studies; coaching/mentoring/tutoring; and performing industrial attachments, consultancies and community services. Part-time and / or contract staff should also be considered in the CPD programmes.

6. EDUCATIONAL RESOURCES

“Adequate educational resources are necessary to support the teaching and learning activities of a programme. These include all the required academic and instructional expertise, physical facilities, information and communication technologies, research facilities and finance.” (COPPA 2nd Edition, 2017).

HEPs are required to provide sufficient resources conducive to support teaching and learning in the field. Lecture and tutorial rooms, teaching laboratory, technical support/facilities and sufficient space to accommodate student-centred learning must be provided according to the current needs. However, educational resources recommended for related programmes as listed are the minimum requirement provided by HEPs but not limited to those resources only, depending on respective programmes.

Students with special needs and those facing personal, relationship or identity problems can be assisted through special-purpose facilities and professional counselling. Refer to Garis Panduan Pelaksanaan Dasar Inklusif Orang Kurang Upaya di Institusi Pendidikan Tinggi (2019) dan Pelan Pembangunan Pendidikan Malaysia (PPPM).

Educational resources recommended for general programmes include:

- i. Sufficient qualified experts in the related field.
- ii. Technical support.
- iii. Reliable and adequate facilities/infrastructure.
- iv. Reliable and adequate Internet access.
- v. Lecture/tutorial rooms (with sufficient audio-visual facilities)/teaching laboratory.
- vi. Sufficient access to analytical (e.g. XRD, XRF, ICP, AAS), testing (e.g. UCS, Point Load, Particle Size), field (e.g. compass, hammer, GPS) and petrographic equipment and facilities.

- vii. Sufficient access to microscopic and macroscopic mineral, rock and fossil specimens.
- viii. Sufficient access to computer laboratory with relevant software according to the needs of the programme and students.
- ix. Sufficient access to geological and topographic maps.
- x. Library/resource centre (including online resources for teaching and research) with up-to-date resources.
- xi. Standard-sized working space/station (with access to the internet) throughout their studies.
- xii. Facilities and equipment for students with special needs.
- xiii. ODL programme must have sufficient and appropriate physical and virtual facilities (electronic learning platform) and educational resources to ensure its effective delivery, including facilities for practical-based and research programmes and for those with special needs.

All above-mentioned facilities must meet the minimum health and safety standards and special needs.

All lapidary/classrooms/labs/workstations must be equipped with appropriate space, accessories, equipment with enough computers (if related to the courses) and working areas, and they must meet the minimum safety standards.

All programmes run by the HEP must have the appropriate reading references and materials accessible to the staff and students and must be available in the HEP's library or resource room.

The programme must have sufficient, relevant and appropriate physical facilities and training resources at the commencement of the programme to ensure its effective

delivery, including facilities for practical-based programmes and those with special needs.

All shared facilities between the industry and HEPs must be stated in the Memorandum of Understanding (MoU)/Memorandum of Agreement (MoA)/Letter of Agreement (LoA).

7. PROGRAMME MANAGEMENT

“There are many ways of administering an educational institution and the methods of management differ between Higher Education Providers (HEPs). Nevertheless, governance that reflects the collective leadership of an academic organization must emphasise excellence and scholarship. At the departmental level, it is crucial that the leadership provides clear guidelines and directions, builds relationships amongst the different constituents based on collegiality and transparency, manages finances and other resources with accountability, forges a partnership with significant stakeholders in educational delivery, teaching and consultancy, and dedicates itself to academic and scholarly endeavours. Whilst formalised arrangements can protect these relationships, they are best developed by a culture of reciprocity, mutuality and open communication.” (COPPA 2nd Edition, 2017).

This document will not raise issues pertaining to governance and administration as these are at the institutional level rather than the programme level. In this PS, academic leadership is largely focused on suitably qualified persons in the respective field to carry out the necessary curriculum monitoring, review and assessment. The leaders of the programmes should demonstrate knowledge of the field and the attributes of good ethical values in work practices. It is advisable that leaders of programmes have industry experience or relevant professional certification.

A person holding the programme leadership position must:

- i. have related academic qualifications and experience in the area of study.
- ii. have a broad-based view of the related programme and perception of the

industry and its impact on the environment and society.

- iii. have the ability to inspire others to perform at their full potential.
- iv. have the ability to listen and communicate effectively with sensitivity to both individuals and groups.
- v. be able to show a strong commitment to translating the organization's aspirations through initiatives consistent with the organization's purposes.
- vi. be able to make sound judgements based on relevant input or information.
- vii. be flexible to the changing demands and pressures from key stakeholders to achieve individual and organizational goals.
- viii. be able to promote continuous learning among staff and students.
- ix. be able to establish a constructive mechanism for collaboration with stakeholders.

The programme leader, i.e., Head of Programme, Programme Coordinator, or equivalent positions, must meet the qualification and experience requirements as stated in **Table 7**.

Table 7: Criteria for selection of programme leader

MQF LEVEL	MINIMUM REQUIREMENT
BACHELOR'S DEGREE PROGRAMME (LEVEL 6, MQF)	• A Programme Leader must possess one higher academic qualification with at least one qualification related to the programme; AND have FIVE (5) years of working experience including academic experience; AND registered with Board of Geology

Notes:

- i. The appointment for the Management of the Faculty, Academic Centre, Department, School, etc., requires the HEP's to document the process of appointments accordingly as a policy paper to support its structural frameworks and represent

- appropriately towards the governing of the programme.
- ii. Experience can be cumulative experience even before acquiring the required qualification for a particular level of study. However, the experience must be related to the level of study as well as the content.

8. PROGRAMME MONITORING, REVIEW AND CONTINUAL QUALITY IMPROVEMENT

“Quality enhancement ⁵calls for programmes to be regularly monitored, reviewed and evaluated. These include the responsibility of the department to monitor, review and evaluate the structures and processes and curriculum components, as well as the student’s progress, employability and performance.

In addition, feedback from multiple sources such as students, alumni, academic staff, employers, professional bodies and informed citizens are encouraged to assist in enhancing the quality of the programme.

Measures of student performances include the average study duration, assessment scores, passing rate in examinations, success and dropout rates, student and alumni reports about their learning experience, as well as time spent by students in areas of special interest. Evaluation of student performances in examinations can reveal very useful information. For example, if the student selection has been done correctly, a high failure rate in a programme would indicate something amiss in the curriculum content, teaching-learning activities or assessment system. The programme committees need to monitor the performance rate in each course and investigate if the rate is too high or too low.

Student feedback, for example, through questionnaires and representation in programme committees, is useful for identifying specific problems and for continual improvement of the programme.

⁵ Standards in this area are best read together with the Guidelines to Good Practices: Monitoring, Reviewing and Continually Improving Institutional Quality and the Guidelines on Terms Used for External Examiner, External Advisor and Advisory Board, which are available on the MQA Portal: www.mqa.gov.my.

One method to evaluate programme effectiveness is a longitudinal study of the graduates. The department should have mechanisms for monitoring the performance of its graduates and for obtaining the perceptions of society and employers on the strengths and weaknesses of the graduates and to respond appropriately.” (COPPA 2nd Edition, 2017).

“Comprehensive monitoring and review of the programme for its improvement are to be carried out with a proper mechanism, considering feedback from various parties and the stakeholders. The committee responsible for this should be granted adequate autonomy to carry out its responsibility effectively. It is desirable that the departments work in association with the HEP’s central Quality Assurance Unit to ensure objectivity.” (COPPA 2nd Edition, 2017).

The HEPs are expected to provide evidence of their ability to keep pace with the changes in the field of related area or expert and the requirements of the stakeholders. These may be demonstrated by, but are not limited, to the following:

- i. The department must have a Quality Assurance (QA) unit for internal quality assurance of the department to work hand-in-hand with the QA unit of the HEP;
- ii. A comprehensive curriculum review should be conducted at least once every 3 to 5 years. However, updating the curriculum to keep pace with current developments should be conducted at more regular intervals;
- iii. Compulsory appointment of external advisors, examiners (academicians) and Board of Geologist’s representative who are qualified in the related fields to assure the quality of the students of the Bachelor’s degree (Level 6, MQF) and above programmes;
- iv. Continual benchmarking against top universities at the national and international levels.
- v. Linkages with related professional bodies, government agencies and industry;

- vi. Engagement with industry practitioners through appointment as a member of the Board of Studies, appointment of adjunct positions, guest speakers; etc.
- vii. Annual dialogue sessions with stakeholders;
- viii. Active participation of academic staff at relevant conferences, seminars, workshops and short courses;
- ix. Presentations by invited speakers, local or international;
- x. Organising conferences, seminars and workshops;
- xi. Encouraging international exchange among students and staff;
- xii. Continuous review of industrial attachment practices and records.

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APPENDIX 1

LIST OF PANEL MEMBERS

NO.	PANEL MEMBER	ORGANISATION
1.	Prof Madya P.Geol. Dr Mohd Rozi Bin Umor	Program Geologi, Fakulti Sains & Teknologi, Universiti Kebangsaan Malaysia Advisor (BoG Representative)
2.	Prof Madya P.Geol. Dr Habibah Bt Hj Jamil	Program Geologi, Fakulti Sains & Teknologi, Universiti Kebangsaan Malaysia Chairman
3.	Dr. Elvaene James	Fakulti Sains Bumi Universiti Malaysia Kelantan Deputy Chairman
4.	Puan Asmaa' Binti Suid	Malaysian Qualification Agency (MQA) MQA Representative
UNIVERSITIES REPRESENTATIVE		
5.	P.Geol. Dr. Mohd Suhaili Bin Ismail	Department of Geoscience Universiti Teknologi Petronas
6.	Prof. Madya P.Geol. Dr. Ahmad Farid Bin Abu Bakar	Jabatan Geologi, Fakulti Sains, Universiti Malaya & Institute of Geology Malaysia (IGM)
7.	P.Geol. Dr. Norasiah Binti Sulaiman	Program Geologi, Fakulti Sains & Teknologi, Universiti Kebangsaan Malaysia

NO.	PANEL MEMBER	ORGANISATION
8.	P.Geol. Dr. Ng Tham Fatt	Jabatan Geologi, Fakulti Sains, Universiti Malaya
9.	P.Geol. Dr. Junaidi Bin Asis	Fakulti Sains Dan Sumber Alam Universiti Malaysia Sabah
10.	P.Geol. Dr. Nur Azwin Ismail	Program Geofizik Universiti Sains Malaysia
11.	P.Geol. Dr. Teoh Ying Jia	Program Geofizik Universiti Sains Malaysia
12.	Prof. Madya P.Geol. Dr. Hasrizal bin Shaari	Program Geosains Marin Fakulti Sains dan Sekitaran Marin Universiti Malaysia Terengganu
13.	P.Geol. Dr. Khaira binti Ismail	Pusat Kemajuan Ekonomi Biru Universiti Malaysia Terengganu
14.	Rozita binti Shamsuddin	Curtin Planning and Quality Office in Kuala Lumpur
INDUSTRY REPRESENTATIVE		
15.	P.Geol. Juhari Bin Ismail	Petroliaam Nasional Berhad (PETRONAS)
16.	P.Geol. Suhaileen Bt Shahrar	Petroliaam Nasional Berhad (PETRONAS)
17.	P.Geol. Mohamad Faizal bin Idris	Petroliaam Nasional Berhad (PETRONAS)

NO.	PANEL MEMBER	ORGANISATION
18.	P.Geol. Qalam A'zad Rosle	Jabatan Mineral Dan Geosains Selangor/Wilayah Persekutuan
19.	P.Geol. Abd Rahim Bin Harun	Jabatan Mineral Dan Geosains Malaysia (Ibu Pejabat)
20.	P.Geol. Ahmad Nizam Bin Hasan	Geosolution Resources Group & Geological Society of Malaysia
21.	P.Geol. Norazianti Binti Asmari	Geodata Services Resources Sdn Bhd
22.	Dato' Ts. P.Geol. Khairul Fahmee Bin Mat Khari	Uji Teguh Group

APPENDIX 2

LIST OF ORGANISATIONS INVOLVED IN THE STAKEHOLDER WORKSHOPS

1. Higher Education Provider

Universiti Kebangsaan Malaysia (UKM)

Universiti Malaya (UM)

Universiti Malaysia Kelantan (UMK)

Universiti Malaysia Sabah (UMS)

Universiti Teknologi PETRONAS (UTP)

Universiti Sains Malaysia (USM)

Universiti Malaysia Terengganu (UMT)

Curtin University, Sarawak

2. Government Agency

Malaysian Qualification Agency (MQA)

Jabatan Mineral dan Geosains Malaysia (JMG)

3. Industry

Petroleum Nasional Berhad (PETRONAS)

Geosolution Resources Group

Geodata Services Resources Sdn Bhd

Uji Teguh Group

4. Society

Institute of Geology Malaysia (IGM)

Geological Society of Malaysia (GSM)

5. BoG Members
6. Academicians
7. HEP Senior Management Team

APPENDIX 3

BODY OF KNOWLEDGE

COMMON CORE		
No	AREA/THEME	BODY OF KNOWLEDGE
1	Earth System	Formation of the Earth and the Solar System
		Plate tectonics
		Geophysical and geochemical properties of the Earth and Earth Systems
		Earth's layers and Spheres, and connectivity in the Earth System
2	Earth Material	Petrography and petrology of rocks and minerals
		Distribution of Earth materials, natural resources and natural hazards
3	Earth Processes	Igneous, sedimentary and metamorphic processes
		Hydrogeology and fluid flow
		Earth surface processes, including superficial deposits, geomorphology and landscape
		Deformation and rock mechanics
4	Earth History	Evolution of Earth Systems through time
		Dynamic stratigraphy, major events in Earth history, and evolution of life on Earth
		Geology of Malaysia and Southeast Asia

COMMON CORE		
No	AREA/THEME	BODY OF KNOWLEDGE
5	Geological Techniques & Applications	Creation, analysis and interpretation of geospatial data (including geological maps and cross-sections) in both digital and analogue formats, using appropriate professional software such as GIS
		Fieldwork and instrument-based investigation of the surface and sub-surface of the Earth, including remote sensing, geophysical and geochemical techniques

GLOSSARY

1.	Continuous Assessment basis	Assessment conducted on a continuous throughout the learning experience and includes formative and summative assessment opportunities. It is carried out at any of the predetermined points of the total learning experience. These consecutive assessment opportunities, which include a variety of assessment methods, have predetermined weightings and include the assessment of all the outcomes within the module. For more information, refer to the Guidelines to Good Practices: Assessment of Student Learning, 2nd Edition (2023).
2.	Core	May include common and/or discipline that is considered appropriate for the programme
3.	Course	Components of a programme. The term 'courses' is used interchangeably with modules, subjects or units.
4.	Dissertation	Documentation of the original research prepared and submitted by the candidate for the award of the degree for Master's programmes by research and mixed mode.
5.	Elective	Elective courses can include non-related subjects from any discipline. Some HEPs may refer to these as Field or Free Electives.
6.	Final Assessments	The last activity students must complete in a course. A final assessment may be an exam, a

		culminating activity or a combination of the two. This task assesses students' knowledge of a subject and may be cumulative. A final assessment is similar in nature to a summative assessment, which includes end-of-unit tests, standardised testing and cumulative work, such as curating a portfolio over the duration of a course. For more information, refer to Table 12, Management of Student Assessment and Process, in the Guidelines to Good Practices: Assessment of Student Learning, 2nd Edition (2023).
7.	Flexible Learning Pathways	FLPs refer to learning pathways that lead to a qualification. It comprises three phases: 1. Pathways for getting into higher education; 2. Pathways for getting through higher education, i.e., progression or transferability 3. Pathways for getting out of higher education.
8.	Industrial Training / Industrial Attachment	A period of time within the programme when students are required to be placed in the industry to experience a real working environment. For more information, refer to <i>Dasar Latihan Industri Institusi Pengajian Tinggi</i>.
9.	Open and Distance Learning (ODL)	The provision of flexible educational opportunities in terms of access and multiple modes of knowledge acquisition. Please refer to the ODL Guideline by MQA

10.	Programme	An arrangement of courses that are structured for a specified duration with a specified learning volume to achieve the stated learning outcomes. This usually leads to an award of a qualification. Each programme must have PEOs and PLOs and must be measured progressively.
11.	Programme Educational Objective	Broad statements that describe the career and professional accomplishments that the programme is preparing graduates to achieve after they have graduated.
12.	Programme Learning Outcome	Programme Learning Outcomes are the goals students are expected to achieve by the end of their programme. These outcomes include specific and general knowledge, skills, attitudes, and abilities that graduates should demonstrate after completing all the courses in their programme.
13.	Quality Assurance	Comprises planned and systematic actions (policies, strategies, attitudes, procedures and activities) to provide an adequate demonstration that quality is being achieved, maintained and enhanced, and meets the specified standards of teaching, scholarship and research, as well as student-learning experience.
14.	Related Field	This refers to a field of study or discipline that is directly connected or closely associated with

	the subject matter or focus of the qualification or programme being evaluated. It indicates that the knowledge, skills, and competencies obtained in this field are applicable and supportive of the intended qualification.
15. Relevant Field	This term is used to denote a field of study or discipline that may not be directly aligned with the main focus of the qualification or programme, but still provides knowledge or skills that are complementary or beneficial to the overall educational goals. It signifies that while not directly related, the field enhances the understanding or application of the qualification in a broader context.
16. Values-Based Education	Value-Based Education (VBE) focuses on developing moral and ethical values alongside academic rigour. VBE aims to nurture character, personality, attitude and behaviour based on humanistic, societal and communal values.
17. Working Experience	Working experience encompasses expertise gained through professional engagement in industry or academia. Industry experience involves practical roles in organisational settings, while academic experience focuses on teaching, research and scholarly contributions within educational institutions.



PROGRAMME STANDARDS

GEOLOGY

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