The Skybelt Project

PROJECT QUALITY ASSURANCE PLAN

2020

Introduction

This manual provides an outline of good practice in the assurance of quality and its contribution to the promotion of quality enhancement. Importantly, it provides details of good practice derived from the EU to serve as a reference for the assurance of programme quality and shall continue to serve as a benchmark for good practice in programme delivery and continuous improvement for all stakeholders.

This document is to be used as both a reference resource and as a guideline. It has been informed by sources which include the Framework for Qualifications of the European Higher Education Area, Standards and Guidelines for Quality Assurance in the European Higher Education Area and the UK Quality Code for Higher Education. It is written to complement existing National or Institutional practice in programme design, delivery and review to provide high-quality graduates who are able to meet the needs of industry or research institutes in the ICE sector.

It is intended that this manual by utilised as a guideline and reference tool for both course development and ongoing program improvement as the Sybelt project evolves. One of the roles of quality assurance within Higher Education is to provide a process for setting, describing and assuring academic standards and the learning experience of the student. Within this process, the contribution of other stakeholders such as employers is recognised for their contribution to establishing standards of attainment and experiences derived during learning to meet student expectations of employability.

The outcome of this quality assurance process is to instil confidence within the student that they will receive and appropriate quality education and within employer confidence in the attributes, competencies and potential of the graduate entering employment.

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Part 1. Observations on the existing QA methods in Partner Universities

The aims in teaching and learning the courses

The aim of educational programmes taught at Partner Universities, is very similar to that of EU Universities. The students should have demonstrated during the study the following attributes:

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study or area of professional practice

- a comprehensive understanding of techniques applicable to their own research or advanced scholarship

- originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline

- conceptual understanding that enables the student:

- to evaluate critically current research and advanced scholarship in the discipline

- to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses. Typically, holders of the qualification will be able to:

- deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences

- demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level

- continue to advance their knowledge and understanding and to develop new skills to a high level.

And holders will have:

- the qualities and transferable skills necessary for employment requiring:

- the exercise of initiative and personal responsibility

- decision-making in complex and unpredictable situations

- the independent learning ability required for continuing professional development.

Teaching and Learning Methods

The current teaching and learning methods deployed at Partner Universities include all or any of the following modes of delivery:

- lectures
- seminars
- practical work in a laboratory
- the use of textbooks, journal papers, electronic databases and other self-study and e-learning materials
- project work
- learning through case studies
- work-based learning

Assessment Methods

Assessment methods used in Partner Universities are as follows:

- essay assignments
- practical reports
- a dissertation or other output from research/project work
- oral examinations
- problem-solving exercises
- oral presentations
- posters
- placement reports

The current practices at Partner Universities

The feature of the programmes in the specialised department in Chinese Universities is that there is a high level of centralisation. The programmes of study and contents of didactic materials are, to a major extent, predetermined by the corresponding Ministry of High Education in order to ensure the quality of teaching and preparation of specialists in a given area.

Overall, project partner University Departments have certain flexibility to adapt teaching materials to local specific demands from the industry on the preparation of students, but these should be approved first at the Departmental level, followed by scrutiny by Faculty and University Boards.

Approximately every five years, Departments are exposed to external inspections by a group of specialists appointed by corresponding Ministries of High Education. A visit by such the commission, in fact, is very similar to an accreditation visit by Professional bodies in the UK. This is the main and very often the only form of external inspection of teaching and learning methods in all Partner Universities.

Quality of teaching and learning is maintained by means of annual Departmental reviews of examination results and teaching materials.

In some cases, examination processes are not anonymous since exams are carried out in the form of a one-to-one verbal assessment of the student's knowledge level of the subject.

All partner Universities have very good research facilities, but some of the teaching equipment used in laboratory works needs renewing.

Case-study: Quality Assurance at Universiti Putra Malaysia

The Quality Assurance at Universiti Putra Malaysia is typical for QA System in Malaysian Universities.

Since 3rd of January 2011, the Faculty of Engineering has been utilising UPM Quality Management System (QMS) with a single certification, which is a combination of all the existing certifications at different centres and faculties for all major activities conducted at the university level: teaching, research, professional services, and support services. The system has been managed, coordinated and monitored by the Centre for Quality Assurance (CQA), Universiti Putra Malaysia. The centre was officially established on the 1st of November 2015 and is placed under the direct supervision of Vice-Chancellor to meet the academic needs of Malaysian Qualifications (MQA) (for the purpose of the Self-Accreditation).

The establishment of CQA makes it possible to reassess the Quality Assurance System (QA System) for better organisation and efficiency with the following objectives:

- To plan, implement and monitor the implementation and effectiveness of the International Organisation for Standardization (ISO).
- To plan, implement and monitor the implementation and effectiveness of the Self Accreditation.
- To plan, implement and monitor the implementation and effectiveness of Laboratory Accreditation.
- To serve as a liaison with external parties in conducting quality assurance agenda.

At the Engineering Faculty level, the quality management system is monitored by the Quality Assurance Unit headed by the Deputy Management Representative, who also serves as the Deputy Registrar. The function and responsibility of the Quality Assurance Unit are to provide services related to the Quality Management System and report to the UPM CQA office. It includes:
1. To manage the production and distribution of the QMS documents as listed in the list of the QMS controlled documents;
2. To provide advice and explanation to all Faculty staff on how to implement the QMS through courses, training, and announcements in accordance with the procedures and guidelines that

were previously developed;
3. To monitor and review implementation status of the QMS through Internal Quality Audit, Management Review Meeting, customer;
4. To analyse the results of revision on the implementation status of the QMS and recommend the faculty management about corrective action and the actions to be taken to improve the QMS;
5. To monitor, review and take appropriate action on feedback received related to effectiveness and the efficiency of QMS implementation;
6. To ensure effective communication among the staff concerning quality activities implemented for updating data and records.

Implementation of QMS activities is planned and monitored at Quality Assurance Unit meetings (Faculty level) and Quality Assurance Committee meeting (University level) on an ongoing basis.

The concept of QMS implemented in the Faculty of Engineering is based on the customers or interested parties being involved in the process. Leading to the results of the QMS towards the goals or KPI set by the organisation. The faculty has to determine external and internal issues that are relevant to its purpose and its strategic direction and that affect its ability to achieve the intended result(s) of its quality management system. The teaching staff understands the needs and expectations of interested parties due to their effect or potential effect on the Faculty of Engineering's ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements.

The methodology of Plan-Do-Check-Action or the PDCA cycle is applied to all processes within the Quality Management System. This methodology requires the teaching staff is aware of what to be achieved and to plan all the activities (processes) that are related to the core business. Using this knowledge, the staff has to implement/carry out all the processes. This is followed by monitoring and measuring the processes performance against policies, objectives and requirements for the service and reporting the results. After analysing the results, the staff is required to take actions to continuously improve process performance.

Figure 1 shows the map of the implementation of teaching and learning activities in the Faculty's Undegdrauate Study Programme. The process flow starts with a planning process, operational or activities of teaching and learning, followed by the assessment of student performance. This process is repeated every semester until the end of the study period.

Table 1 summarises the overall core process with the relevant inputs and outputs and quality objectives to be met.

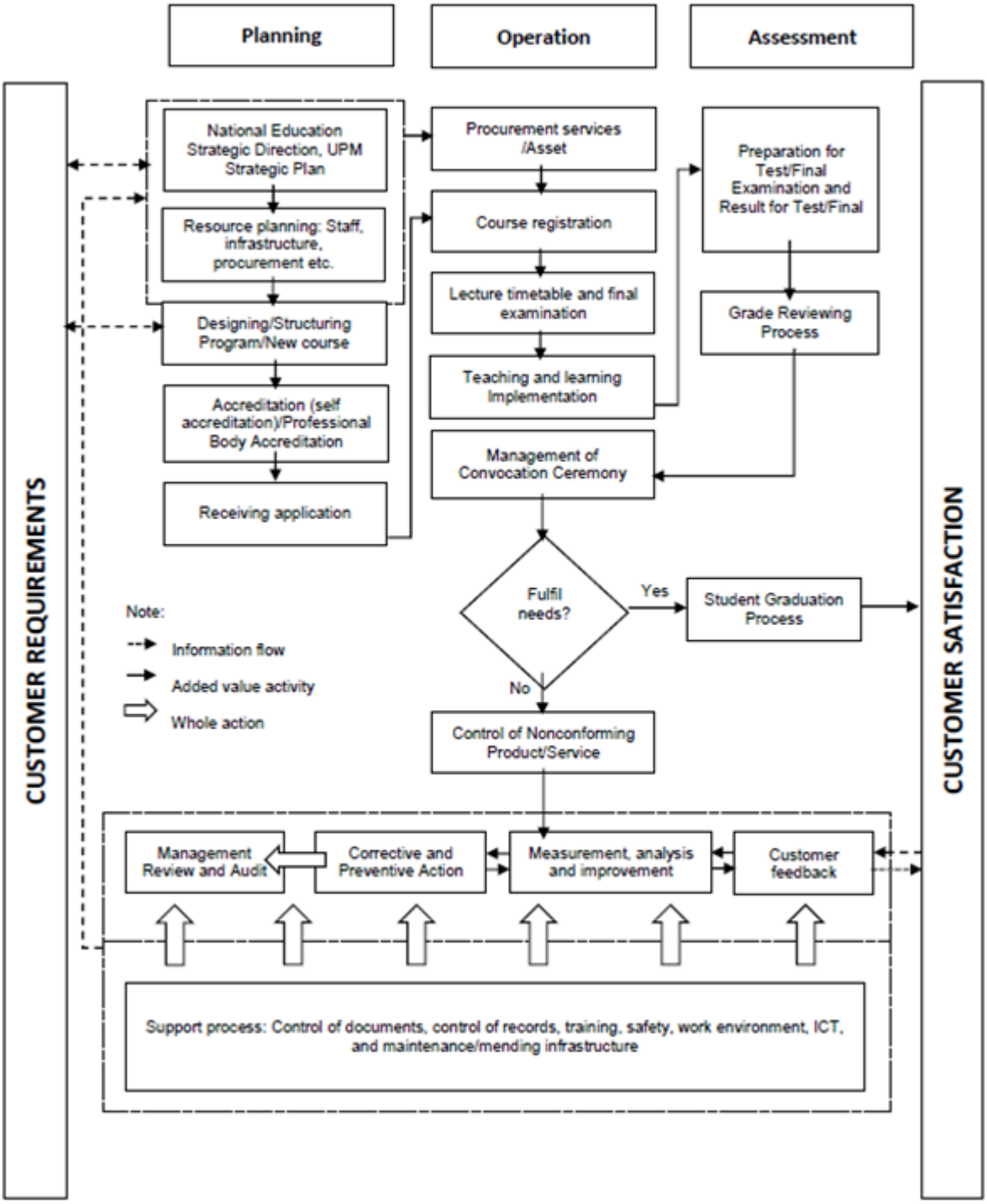

Figure 1. Process Mapping for Undergraduate Study

Table 1. Relationship between Core Process and Quality Objectives

No.	Core Process	Input	Output	Quality objectives
1	Program Planning and Deve-lopment	Engineering Education Model	Curriculum Syllabus Faculty's Guide Book	Offer curriculum that is accredited by Engineering Accreditation Council (EAC)
2	Programme Offering	Curriculum List of Subjects List of Classrooms List of Lecturers List of Programmes List of Exempted Subjects Academic Calendar Students' Guide Book	Time Table Registration Slip List of new students List of students based on subjects Copy of Approved Exempted Subjects Teaching Plan Lecture Notes	Control entrance Qualification and enrolments of students, provide a time table that is student-friendly and maintain appropriate staff-student ratio
3	Teaching	Syllabus List of students based on subjects Teaching time table Teaching Plan	Examination time table Examination question paper Lecture notes Final examination attendance list Final year project report Industrial training report Laboratory reports Assignment	Conduct lectures in small class size and laboratories with low student equipment
4	Assessment	Examination Questions Teaching Evaluation Form List of Students	List of grades List of marks Teaching evaluation report	Ensure a negative trend of CGPA <2.0
5	Graduation	List of grades List of marks	List of graduating students List of failures	Ensure normal distribution of students CGPA for each Programme
6	Service Evaluation	List of subjects Time table evaluation form	Teaching Evaluation report Service evaluation report	Ensure that the average Evaluation point is more than the required level

In the Faculty of Engineering, the Dean and Heads of Departments are responsible for quality assurance. They are responsible for setting the quality objectives of the QMS to be implemented in the Faculty. They are also responsible for providing direction and resources to achieve planned targets. Workers are imparted the strategic direction of an organisation through a committed top management, which ensures communications are effective, authorities and responsibilities are clear, planning and implementation are monitored and analysed for inputs to continual improvement.

A number of procedures were developed to ensure quality is embedded in every level of teaching and learning. The Faculty practices the moderation of examination papers by external examiners as well as

peer-reviews. Lecturers implement their lectures and class activities following the established procedures built in some control mechanisms through Teaching Plan that list the activities, delivery modes and level of taxonomy to achieve for each of the course the desirable outcomes.

The Faculty also appoints individual external assessors from reputable Universities for its eight programmes. The Department assessor, who also acts as the external examiner, evaluates the programmes in terms of the five core criteria as per EAC requirements. This is a part of the benchmarking exercise in the Faculty.

Apart from these procedures, the Faculty also seeks input from students for continual improvement of teaching through Teaching Evaluation conducted online between weeks 12 and 14 of the semester. The results of the exercise are used to help lecturers to improve their teaching in the following semesters. Lecturers also take the initiatives to benchmark the courses they teach against those from other universities and keep the material of the courses up to date so that the syllabi are relevant.

Case-Study: ASEAN University Network Quality Assurance (Thailand)

The AUN-QA Models for higher education comprise strategic, systemic and tactical dimensions (see Figure 2) and are subjected to both internal and external QA assessment.

Figure 2. AUN-QA Models for Higher Education.

Internal QA ensures that an institution, system or programme has policies and mechanisms in place to make sure that it is meeting its own objectives and standards.

External QA is performed by an organisation or individuals outside the institution. The assessors evaluate the operation of the institution, system or programme in order to determine whether it meets the agreed upon or predetermined standards.

The AUN-QA models are applicable to the diverse universities in ASEAN which are also aligned to both regional and international quality assurance frameworks.

The strategic QA at institutional level encompasses 11 criteria as illustrated in Figure 3.

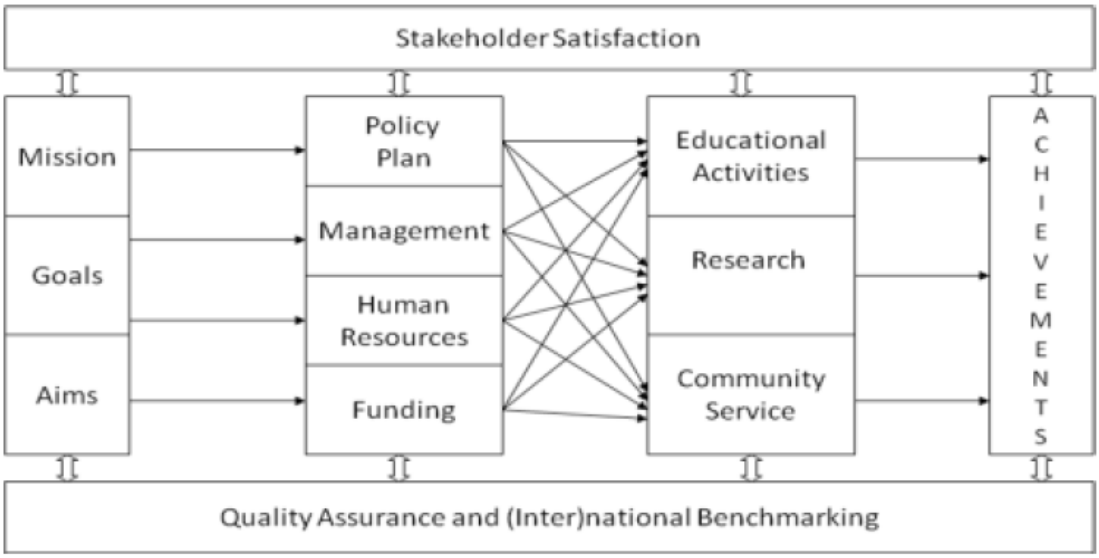

Figure 3. AUN-QA Model for Institutional Level.

Strategic QA at institutional level starts with the needs of the stakeholders which are translated into the university's vision, mission, goals and aims or objectives. This means that quality assurance and quality assessment will always start with the mission and goals (Column 1) and end with the achievements (column 4) to satisfy stakeholders' needs.

The second column shows how the university is planning to achieve the goals:

- translation of the goals into a policy document and policy strategy;
- management structure and management style of the university;
- human resource management: input of staff to achieve the goals; and
- funding to achieve the intended goals

The third column shows the core activities of a university:

- educational activities of teaching and learning
- research activities
- contribution to society and to the support and development of the community.

For continuous improvement, institutions should implement an effective QA system and benchmark their practices to achieve educational excellence.

AUN-QA Model for Internal Quality Assurance (IQA) System

The AUN-QA model for an IQA system (see 4) consists of the following areas:

- internal quality assurance framework;
- monitoring instruments;
- evaluation instruments;
- special QA-processes to safeguard specific activities;

- specific QA-instruments; and
- follow-up activities for making improvements

An IQA system is the totality of systems, resources and information devoted to setting up, maintaining and improving the quality and standards of teaching, student learning experience, research, and service to the community. It is a system where the QA mechanisms are working to maintain and enhance the level of quality in higher education.

AUN-QA Model for Programme Level

The AUN-QA model for programme level (see Figure 4) starts with stakeholders needs. These needs are formulated into the expected learning outcomes which drive the programme (1st Column). There are four rows in the middle of the model and the first row addresses the question of how the expected learning outcomes are translated into the programme; and how they can be achieved via teaching and learning approach and student assessment.

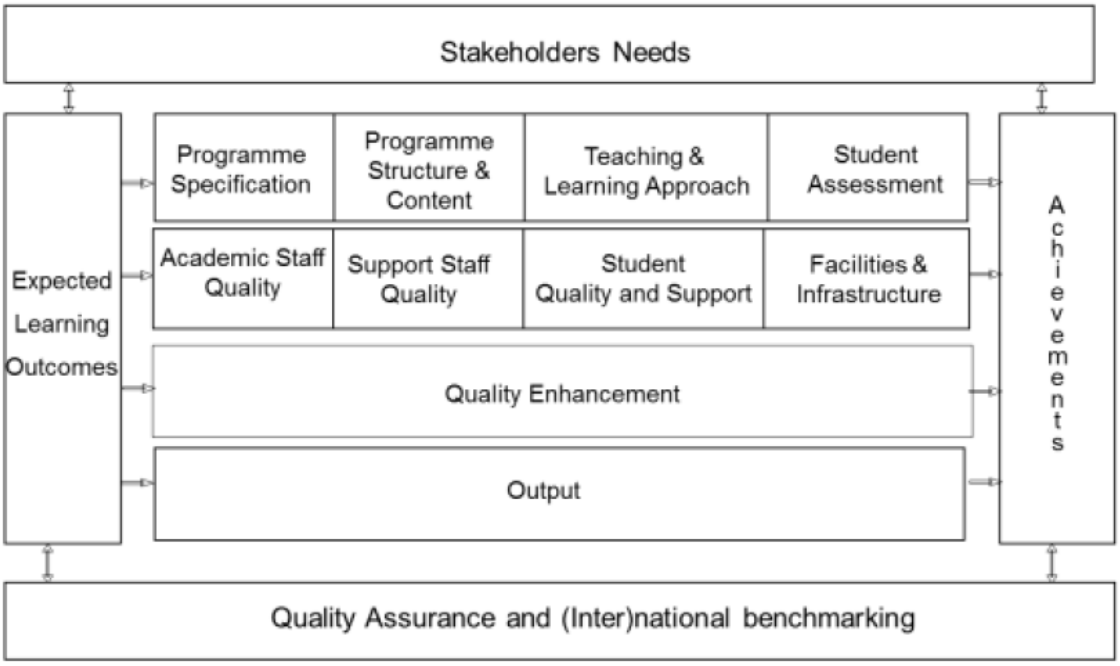

Figure 4. The AUN-QA Model for Programme Level.

The second row considers the "input" into the process including academic and support staff; student quality and support; and facilities and infrastructure.

The third row addresses the quality enhancement of the programme covering curriculum design and development, teaching and learning, student assessment, quality of support services and facilities, and stakeholders' feedback.

The fourth row focuses on the output of the programme including pass rates and dropout rates, the average time to graduate, employability of the graduates, research activities and stakeholders' satisfaction.

The final column addresses the achievements of the expected learning outcomes and the programme.

The model ends with the fulfilment of stakeholders' needs and the continuous improvement of the quality assurance system and benchmarking to seek best practices.

The 3rd version of the AUN-QA model for programme level encompasses the following 11 criteria:
1. Expected Learning Outcomes
2. Programme Specification
3. Programme Structure and Content
4. Teaching and Learning Approach
5. Student Assessment
6. Academic Staff Quality
7. Support Staff Quality
8. Student Quality and Support
9. Facilities and Infrastructure
10. Quality Enhancement
11. Output

For this project, criteria 1-6 and 9-10 are the most relevant ones.

The requirements of each AUN-QA criterion are presented below To facilitate implementation and assessment of each criterion, the list of statements of each criterion is translated into sub-criterion listed in the corresponding checklists.

AUN-QA Criterion 1 (Learning outcomes)
1. The formulation of the expected learning outcomes takes into account and reflects the vision and mission of the institution. The vision and mission are explicit and known to staff and students.
2. The programme shows the expected learning outcomes of the graduate. Each course and lesson should clearly be designed to achieve its expected learning outcomes which should be aligned to the programme expected learning outcomes.
3. The programme is designed to cover both subject-specific outcomes that relate to the knowledge and skills of the subject discipline; and generic (sometimes called transferable skills) outcomes that relate to any and all disciplines e.g. written and oral communication, problem-solving, information technology, teambuilding skills, etc.
4. The programme has clearly formulated the expected learning outcomes, which reflect the relevant demands and needs of the stakeholders.

Diagnostic Questions:
− What is the purpose of the study programme?
− What are the expected learning outcomes?
− How are the expected learning outcomes formulated?
− Do the learning outcomes reflect the vision and mission of the university, faculty or department?
− Does the labour market set any specific requirements for graduates to meet?
− To what extent is the content of the programme tuned to the labour market?
− Is there a well-defined job profile?
− How are the learning outcomes made known to staff and students?
− Are the learning outcomes measurable and achievable? How?
− To what extent have the learning outcomes been achieved?
− Are learning outcomes being reviewed periodically?
− How are the learning outcomes translated into concrete requirements of the graduate (i.e. knowledge, skills and attitudes including habits of mind)?

AUN-QA Criterion 1 – Checklist

1	**Expected Learning Outcomes**	1	2	3	4	5	6	7
1.1	The expected learning outcomes have been clearly formulated and aligned with the vision and mission of the university [1,2]							
1.2	The expected learning outcomes cover both subject specific and generic (i.e. transferable) learning outcomes [3]							
1.3	The expected learning outcomes clearly reflect the requirements of the stakeholders [4]							
	Overall opinion							

Here Grades from 1 to 7 are as follows:
1- Absolutely Inadequate; 2- Inadequate and Improvement is Necessary; 3- Inadequate but Minor Improvement Will Make It Adequate; 4- Adequate as Expected; 5- Better Than Adequate; 6 - Example of Best Practices; 7 - Excellent (Example of World-class or Leading Practices).

Sources of Evidence:

- Programme and course specifications
- Course brochure and prospectus or bulletin
- Skills matrix
- Stakeholders' input
- University and faculty websites
- Curriculum review minutes and documents
- Accreditation and benchmarking reports

AUN-QA Criterion 2 (Programme Specification)
1. The Institution is recommended to publish and communicate the programme and course specifications for each programme it offers, and give detailed information about the programme to help stakeholders make an informed choice about the programme.
2. Programme specification including course specifications describes the expected learning outcomes in terms of knowledge, skills and attitudes. They help students to understand the teaching and learning methods that enable the outcome to be achieved; the assessment methods that enable achievement to be demonstrated; and the relationship of the programme and its study elements.

The information to be included in the programme specification is listed below.

- Awarding body/institution
- Teaching institution (if different)
- Details of the accreditation by a professional or statutory body
- Name of the final award
- Programme title
- Expected Learning outcomes of the programme
- Admission criteria or requirements to the programme
- Relevant subject benchmark statements and other external and internal reference points used to provide information on programme outcomes
- Programme structure and requirements including levels, courses, credits, etc.
- Date on which the programme specification was written or revised

The information to be included in the course specification is shown below.

- Course title
- Course requirements such as pre-requisite to register for the course, credits, etc.

- Expected learning outcomes of the course in terms of knowledge, skills and attitudes
- Teaching, learning and assessment methods to enable outcomes to be achieved and demonstrated
- Course description and outline or syllabus
- Details of student assessment
- Date on which the course specification was written or revised.

Diagnostic Questions
− Are the expected learning outcomes translated into the programme and its courses?
− What information is documented in the programme and course specifications?
− Is the course specification standardised across the programme?
− Is the programme specification published and made available or known to stakeholders?
− What is the process for reviewing the programme and course specifications?

AUN-QA Criterion 2 – Checklist

2	**Programme Specification**	1	2	3	4	5	6	7
2.1	The information in the programme specification is comprehensive and up-to-date [1, 2]							
2.2	The information in the course specification is comprehensive and up-to-date [1, 2]							
2.3	The programme and course specifications are communicated and made available to the stakeholders [1, 2]							
	Overall opinion							

Sources of Evidence:
- Programme and course specifications
- Course brochure and prospectus or bulletin
- Skills matrix
- Stakeholders' input
- University and faculty websites
- Curriculum review minutes and documents
- Accreditation and benchmarking reports

AUN-QA Criterion 3 (Programme Structure and Content)
The curriculum, teaching and learning methods and student assessment are constructively aligned to achieve the expected learning outcomes.
2. The curriculum is designed to meet the expected learning outcomes where the contribution made by each course in achieving the programme's expected learning outcomes is clear.
3. The curriculum is designed so that the subject matter is logically structured, sequenced, and integrated.
4. The curriculum structure shows clearly the relationship and progression of basic courses, the intermediate courses, and the specialised courses.
5. The curriculum is structured so that it is flexible enough to allow students to pursue an area of specialisation and incorporate more recent changes and developments in the field.
6. The curriculum is reviewed periodically to ensure that it remains relevant and up-to-date.

The curriculum should be designed so that the teaching and learning methods and student assessment support the achievement of the expected learning outcomes (the process of the "constructive

alignment". "Constructive" refers to the concept that students construct meaning through relevant learning activities; and "alignment" refers to the situation when teaching and learning activities and student assessment are aligned to achieve the expected learning outcomes).
Constructive alignment of any course involves:

- defining expected learning outcomes that are measurable;
- selecting teaching and learning methods that are likely to ensure that the expected learning outcomes are achieved;
- assessing how well the students have achieved the expected learning outcomes as intended.

Diagnostic Questions
− Do the contents of the programme reflect the expected learning outcomes?
− How are the courses in the programme structured so that there is coherence and a seamless relationship of the basic and specialised courses such that the curriculum can be viewed as a whole?
− Has a proper balance been struck between specific and general courses?
− How is the content of the programme kept up-to-date?
− Why was this programme structure chosen?
− Has the educational programme been changed structurally over recent years? If so, why?
− Does the programme promote diversity, student mobility and/or cross-border education?
− Is the relation between basic courses, intermediate courses and specialised courses in the compulsory section and the optional section logical?
− What is the duration of the programme?
− What is the duration and sequence of each course? Is it logical?
− What benchmarks are used in designing the programme and its courses?
− How are teaching and learning methods and student assessment selected to align with the expected learning outcomes?

AUN-QA Criterion 3 – Checklist

3	**Programme Structure and Content**	1	2	3	4	5	6	7
3.1	The curriculum is designed based on constructive alignment with the expected learning outcomes [1]							
3.2	The contribution made by each course to achieve the expected learning outcomes is clear [2]							
3.3	The curriculum is logically structured, sequenced, integrated and up-to-date [3, 4, 5, 6]							
	Overall opinion							

Sources of Evidence:

- Programme and course specifications
- Brochure, prospectus or bulletin
- Curriculum map
- Skills matrix
- Stakeholders' input and feedback
- University and faculty websites
- Curriculum review minutes and documents
- Accreditation and benchmarking reports

AUN-QA Criterion 4 (Teaching and Learning Approach)
The teaching and learning approach is often dictated by the educational philosophy of the university. Educational philosophy can be defined as a set of related beliefs that influences

what and how students should be taught. It defines the purpose of education, the roles of teachers and students, and what should be taught and by what methods.
2. Quality learning is understood as involving the active construction of meaning by the student, and not just something that is imparted by the teacher. It is a deep approach of learning that seeks to make meaning and achieve understanding.
3. Quality learning is also largely dependent on the approach that the learner takes when learning. This in turn is dependent on the concepts that the learner holds of learning, what he or she knows about his or her own learning, and the strategies she or he chooses to use.
4. Quality learning embraces the principles of learning. Students learn best in a relaxed, supportive, and cooperative learning environment.
5. In promoting responsibility in learning, teachers should:
a. create a teaching-learning environment that enables individuals to participate responsibly in the learning process;
b. provide curricula that are flexible and enable learners to make meaningful choices in terms of subject content, programme routes, approaches to assessment and modes and duration of study.
6. The teaching and learning approach should promote learning, learning how to learn and instil in students a commitment of lifelong learning (e.g. commitment to critical inquiry, information-processing skills, a willingness to experiment with new ideas and practices, etc.).

In line with the overarching purpose of higher education in fostering holistic education of students, quality learning results in students acquiring the following skills:
− The ability to discover knowledge for oneself. Learners have research skills and the ability to analyse and synthesise the material they gather. Learners understand various learning strategies and can choose the most appropriate for the task at hand.
− The ability to retain knowledge long term. An approach to learning that emphasises construction of meanings rather than memorising facts for greater retention.
− The ability to perceive relations between old knowledge and new. Quality learning is always trying to bring information from various resources together.
− The ability to create new knowledge. Quality learners discover what others have learnt and documented, perceiving the relations between that knowledge and their own experiences and previous learning to develop new insights.
− The ability to apply one's knowledge to solve problems.
− The ability to communicate one's knowledge to others. Quality learners form and substantiate independent thought and action in a coherent and articulated fashion.
− An eagerness to know more. Quality learners are lifelong learners.

Conditions necessary for quality learning are:
− Quality learning occurs when learners are ready – in cognitive and emotional terms – to meet the demands of the learning task
− Quality learning occurs when learners have a reason for learning
− Quality learning occurs when learners explicitly relate previous knowledge to new one
− Quality learning occurs when learners are active in the learning process
− Quality learning occurs when the learning environment offers adequate support for learners.

There is no single teaching and learning method that is valid for all situations. Thought must be given to the teaching and learning approach behind the curriculum.

Diagnostic Questions:
− Is there an explicit educational philosophy shared by all staff members?
− Is diversity of learning environment promoted including exchange programme?
− Is teaching provided by other departments satisfactory?
− Are the teaching and learning methods used aligned with the expected learning outcomes?
− How is technology used in teaching and learning?
− How is the teaching and learning approach evaluated? Do the chosen methods fit into the learning outcomes of the courses? Is there sufficient variety in the methods?
− Are there any circumstances that prevent these desired teaching and learning methods from being used (number of students, infrastructure, teaching skills, etc.)?

If research is a core activity for the university:
− When do students come into contact with research for the first time?
− How is the interrelationship between education and research expressed in the programme?
− How are research findings applied in the programme?

If practical training and/or community service is a specific aspect of the teaching and learning approach:
− Is practical training a compulsory or optional part of the programme?
− How many credits are allocated to these activities?
− Is the level of the practical training and/or community service satisfactory?
− What benefits do communities gain from the service provided by the programme?
− What benefits do employers and students gain from the practical training?
− Are there any bottlenecks in the practical training? If so, what causes them?
− How are students being coached?
− How is the assessment done?

Sources of Evidence:

- Educational philosophy
- Evidence of action learning such as project, practical training, assignment, industrial attachment, etc.
- Student feedback
- Online learning portal
- Programme and course specifications
- Internship reports
- Community involvement
- Memorandum of Understanding (MOU)

<u>AUN-QA Criterion 5 (Student Assessment)</u>
1. Assessment covers:

- New student admission
- Continuous assessment during the course of study
- Final/exit test before graduation

2. In fostering constructive alignment, a variety of assessment methods should be adopted and be congruent with the expected learning outcomes. They should measure the achievement of

all the expected learning outcomes of the programme and its courses.
3. A range of assessment methods is used in a planned manner to serve diagnostic, formative, and summative purposes.
4. The student assessments including timelines, methods, regulations, weight distribution, rubrics and grading should be explicit and communicated to all concerned.
5. Standards applied in assessment schemes are explicit and consistent across the programme.
6. Procedures and methods are applied to ensure that student assessment is valid, reliable and fairly administered.
7. The reliability and validity of assessment methods should be documented and regularly evaluated and new assessment methods are developed and tested.
8. Students have ready access to reasonable appeal procedures.

Student assessment is one of the most important elements of higher education. The outcomes of such assessment have a profound effect on students' future careers. It is therefore important that assessment is carried out professionally at all times and takes into account the extensive knowledge that exists on testing and examination processes. Assessment also provides valuable information for institutions about the efficiency of teaching and learner support. Student assessment is expected to:

- be designed to measure the achievement of the expected learning outcomes;
- be fit for purpose, whether diagnostic, formative or summative; have clear and published grading and marking criteria;
- be undertaken by people who understand the role of assessment in the students' progression towards achieving the knowledge and skills associated with their intended qualification; where possible, not relying on the evaluation of one single examiner;
- take account of all the possible consequences of examination regulations;
- have clear regulations covering student absence, illness and other mitigating circumstances;
- ensure that assessment is conducted securely in accordance with the institution's stated procedures;
- be subjected to administrative verification in ensuring the effectiveness of the procedures.
- inform students about the assessment being used for their programme, what examinations or other assessment methods they will be subjected to, what will be expected of them, and the criteria that will be applied to the assessment of their performance.

AUN-QA Criterion 5 – Checklist

5	Student Assessment	1	2	3	4	5	6	7
5.1	The student assessment is constructively aligned to the achievement of the expected learning outcomes [1, 2]							
5.2	The student assessments including timelines, methods, regulations, weight distribution, rubrics and grading are explicit and communicated to students [4, 5]							
5.3	Methods including assessment rubrics and marking schemes are used to ensure validity, reliability and fairness of student assessment [6, 7]							
5.4	Feedback of student assessment is timely and helps to improve learning [3]							
5.5	Students have ready access to appeal procedure [8]							
	Overall opinion							

Diagnostic Questions
− Is entry assessment done on new students?
− Is exit assessment done on departing (graduating) students?
− To what extent do the assessment and examinations cover the content of the courses and programme? To what extent do the assessment and examinations cover the objectives of the courses and of the programme as a whole?
− Is the assessment criterion-referenced?
− Is a variety of assessment methods used? What are they?
− Are the pass/fail criteria clear?
− Are the assessment/examination regulations clear?
− Are any safeguards in place to ensure objectivity?
− Are the students satisfied with the procedures? What about complaints from students?
− Do clear rules exist for re-assessment and are students satisfied with these?

A special form of student assessment is the final project (dissertation, thesis or project). This requires students to demonstrate their knowledge and skills and their ability to manipulate the knowledge in a new situation.

− Do clear regulations exist for the final project?
− What criteria have been formulated to assess the final project?
− What does the preparation for producing the final project involve (in terms of content, methods, and skills)?
− Is the level of the final project satisfactory?
− Do any bottlenecks exist for producing final project? If so, why?
− How are students being coached?

Sources of Evidence:

- Samples of in-course assessment, project work, thesis, final examination, etc.

- Rubrics
- Marking scheme
- Moderation process
- Appeal procedure
- Programme and course specifications
- Examination regulations

AUN-QA Criterion 6 (Academic Staff Quality)

1. Both short-term and long-term planning of academic staff establishment or needs (including succession, promotion, re-deployment, termination, and retirement plans) are carried out to ensure that the quality and quantity of academic staff fulfil the needs for education, research and service.
2. Staff-to-student ratio and workload are measured and monitored to improve the quality of education, research and service.
3. Competences of academic staff are identified and evaluated. A competent academic staff will be able to:
    - design and deliver a coherent teaching and learning curriculum;
    - apply a range of teaching and learning methods and select most appropriate assessment methods to achieve the expected learning outcomes;
    - develop and use a variety of instructional media;
    - monitor and evaluate their own teaching performance and evaluate courses they deliver;
    - reflect upon their own teaching practices;
    - conduct research and provide services to benefit stakeholders
4. Training and development needs for academic staff are systematically identified, and appropriate training and development activities are implemented to fulfil the identified needs.
5. The types and quantity of research activities by academic staff are established, monitored and benchmarked for improvement.

AUN-QA Criterion 6 Checklist includes the following points:

- Staff-to-student ratio and workload are measured and monitored to improve the quality of education, research and service;
- Competences of academic staff are identified and evaluated;
- Training and developmental needs of academic staff are identified and activities are implemented to fulfil them;
- The types and quantity of research activities by academic staff are established, monitored and
- benchmarked for improvement.

AUN-QA Criterion 9 (Facilities and Infrastructure)

1. The physical resources to deliver the curriculum, including equipment, materials and information technology are sufficient.
2. Equipment is up-to-date, readily available and effectively deployed.
3. Learning resources are selected, filtered, and synchronised with the objectives of the study programme.

4. A digital library is set up in keeping with progress in information and communication technology.
5. Information technology systems are set up to meet the needs of staff and students.
6. The institution provides a highly accessible computer and network infrastructure that enables the campus community to fully exploit information technology for teaching, research, services and administration.

The provision of facilities and infrastructure should be in line with the objectives of the programme. Facilities are also connected to the teaching and learning approach. For example, if the approach is to teach in small working groups, then flexible classroom arrangement should be made available. Learning resources such as computers, e-learning portals, library resources, etc. should be adequately provided to meet the needs of students and staff.

AUN-QA Criterion 9 – Checklist

9	**Facilities and Infrastructure**	1	2	3	4	5	6	7
9.1	The teaching and learning facilities and equipment (lecture halls, classrooms, project rooms, etc.) are adequate and updated to support education and research [1]							
9.2	The library and its resources are adequate and updated to support education and research [3, 4]							
9.3	The laboratories and equipment are adequate and updated to support education and research [1, 2]							
9.4	The IT facilities including e-learning infrastructure are adequate and updated to support education and research [1, 5, 6]							
9.5	The standards for environment, health and safety; and access for people with special needs are defined and implemented [7]							
	Overall opinion							

Diagnostic Questions (relevant to this project):
− Are there enough lecture-halls, seminar rooms, laboratories, reading rooms, and computer rooms available? Do they meet the needs of students and staff?
− Are there sufficient laboratory facilities including support staff?
− Do the laboratories meet the relevant requirements?
− Are sufficient teaching aids and tools available to students and staff?
− What hardware and software are made available to meet the needs of education and research?
− To what extent do the facilities and infrastructure promote or obstruct the delivery of the programme?
− How are the facilities and infrastructure being maintained?

Sources of Evidence:

- List of facilities, equipment, computer hardware and software, etc.
- Maintenance plan

- New facilities and upgrading plans
- Student and staff feedback

AUN-QA Criterion 10 (Quality Enhancement)
1. The curriculum is developed with inputs and feedback from academic staff, students, alumni and stakeholders from industry, government and professional organisations.
2. The curriculum design and development process is established and it is periodically reviewed and evaluated. Enhancements are made to improve its efficiency and effectiveness.
3. The teaching and learning processes and student assessment are continuously reviewed and evaluated to ensure their relevance and alignment to the expected learning outcomes.
4. Research output is used to enhance teaching and learning.
5. Quality of support services and facilities (at the library, laboratory, IT facility and student services) is subject to evaluation and enhancement.
6. Feedback mechanisms to gather inputs and feedback from staff, students, alumni and employers are systematic and subjected to evaluation and enhancement.

Quality enhancement in higher education refers to the improvement of:
- students' knowledge, skills and attitudes or competencies;
- students' learning environment and opportunities; and
- quality of an institution or a programme.

Quality enhancement is a planned initiative that is implemented for the purpose of quality assurance and improvement. It is the continuous search for improvement and best practices.

The confidence and trust of students and other stakeholders in higher education are established and maintained through effective and efficient quality assurance and enhancement activities which ensure that programmes are well-designed, regularly monitored and periodically reviewed, thereby securing their continuing relevance and currency.

The quality assurance and enhancement of programmes are expected to include:
- formulation of expected learning outcomes;
- curriculum design and development process;
- teaching and learning approach and student assessment;
- support resources, facilities and services;
- research application; and
- stakeholders' feedback mechanisms

AUN-QA Criterion 10 – Checklist

10	Quality Enhancement	1	2	3	4	5	6	7
10.1	Stakeholders' needs and feedback serve as input to curriculum design and development [1]							
10.2	The curriculum design and development process is established and subjected to evaluation and enhancement [2]							
10.3	The teaching and learning processes and student assessment are continuously reviewed and evaluated to ensure their relevance and alignment [3]							
10.4	Research output is used to enhance teaching and learning [4]							
10.5	Quality of support services and facilities (at the library, laboratory, IT facility and student services) is subjected to evaluation and enhancement [5]							
10.6	The stakeholder's feedback mechanisms are systematic and subjected to evaluation and enhancement [6]							
	Overall opinion							

Diagnostic Questions:
Curriculum Design and Evaluation
− Who is responsible for designing the curriculum?
− How are academic staff and students involved in the curriculum design?
− What are the roles of the stakeholders in the design and review of the curriculum?
− How do curriculum innovations come about? Who takes the initiative? On the basis of what signals?
− Who is responsible for implementing the curriculum?
− When designing curriculum, is benchmarking with other institutions done?
− In which international networks does the department participate?
− With which institutions abroad do student exchanges take place?
− Has the programme been recognised abroad?
− Is a structured quality assurance in place?
− Who are involved in internal and external quality assurance?
− Is there a curriculum committee? What is its role?
− Is there an examination committee? What is its role?
− How are the programme and its courses evaluated?
− Is the evaluation done systematically?
− How is research output applied to teaching and learning?
− How are students involved in evaluating the curriculum and courses?
− How and to whom are the evaluation results made known?
− What actions are taken to improve the curriculum and its design process?
Feedback Mechanisms:
Mechanisms such as surveys, questionnaires, tracer study, focus group discussions, dialogues, etc. are often used to gather inputs and feedback from stakeholders.
− What feedback mechanisms are used to gather inputs and feedback from staff, students,

alumni and employers?
− Is the way to gather feedback from stakeholders structured and formal?
− How is the quality of support services and facilities evaluated?
− How is feedback analysed and used for improvement?

Sources of Evidence:

- Curriculum design, review and approval process and minutes
- Stakeholders input
- QA of assessment and examination
- External examiners
- Local and international benchmarking
- Programme and course feedback
- Uses of feedback for improvement
- Sample of feedback questionnaire
- Reports from surveys, focus group, dialogue, tracer study, etc.

Quality Asssesment Process results in the preparation of the QA Report and consists of the following procedures (Figure 5):

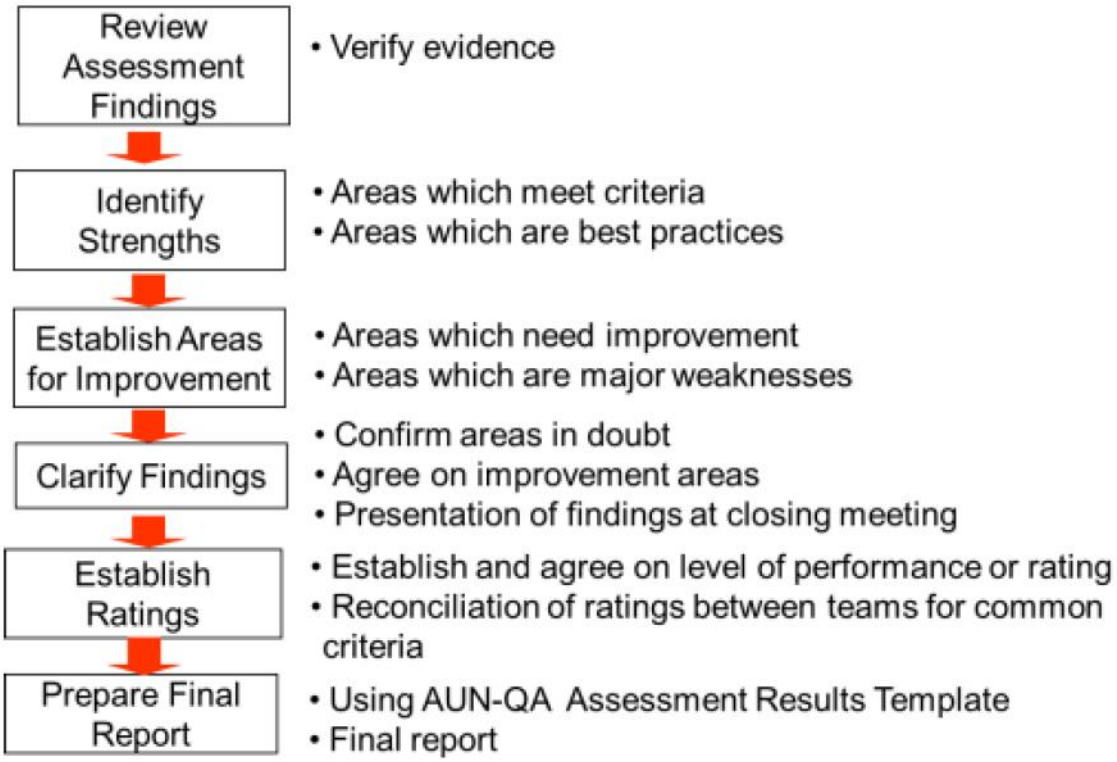

Figure 5. Procedures in Quality Assessment Process.

Part 2. EU Context: Quality Assurance in Higher Education

This section sets out the underlying principles of quality assurance within a framework for good practise, which may be contextualised for application over a wide range of circumstances.

It is recognised that local conditions, custom and practice might differ widely, as will the understanding or interpretation of the words employed within quality assurance.

As a framework, detailed procedures are not described as local autonomy is required for the spirit of quality assurance to flourish and foster mutual trust and transparency of educational process and achievement. In addition to the localisation of quality assurance, there are discipline-specific expectations and stakeholder requirements. For example, there may be requirements derived from opportunities or the obligation of professional registration.

To assist in developing procedures specifically for the Skybelt courses, a summary of standards for quality assurance drawn from the European standard are listed below:

1. Policy and procedures for quality assurance: Institutions should have a policy and associated procedures for the assurance of the quality and standards of their programmes and awards. They should also commit themselves explicitly to the development of culture, which recognises the importance of quality, and quality assurance, in their work. To achieve this, institutions should develop and implement a strategy for the continuous enhancement of quality. The strategy, policy and procedures should have a formal status and be publicly available. They should also include a role for students and other stakeholders.

2. Approval, monitoring and periodic review of programmes and awards: Institutions should have formal mechanisms for the approval, periodic review and monitoring of their programmes and awards.

3. Assessment of students: Students should be assessed using published criteria, regulations and procedures, which are applied consistently.

4. Quality assurance of teaching staff: Institutions should have ways of satisfying themselves that staff involved with the teaching of students are qualified and competent to do so. They should be available to those undertaking external reviews and commented upon in reports.

5. Learning resources and student support: Institutions should ensure that the resources available for the support of student learning are adequate and appropriate for each programme offered.

6. Information systems: Institutions should ensure that they collect, analyse and use relevant information for the effective management of their programmes of study and other activities.

7. Public information: Institutions should regularly publish up to date, impartial and objective information, both quantitative and qualitative, about the programmes and awards they are offering.

The comparison of the Partner University (UPM, Malaysia and Thai Universities) QA policies are mainly in line with the above EU requirements to maintaining the high quality of education, but some of the listed guidelines will be contextualised within the following section to support their application to the Skybelt Programmes. This contextualisation will also be informed by drawing on good practice from a wider base of engineering pedagogy and field of discipline practice, exercised at EU Universities.

Part 3. Proposed QA of Project Activities

Quality Assurance of project activities should be implemented at two levels: internal and external.

Internal QA procedures and upholding requirement standards are implemented through selecting experienced academics to be a part of the Project Executive Committee.

An External Evaluation Team is needed to ensure that Quality Assurance of project activities is implemented at the external level. It is proposed that the External Evaluation Team is made of three independent representatives:

Prof. Fabio Polonara
Department of Industrial Engineering and Mathematical Sciences
Università Politecnica delle Marche

Prof. Maurizio De Lucia
Department of Industrial Engineering
Università degli Studi di Firenze

Prof. Ana Lazaro
Department of Mechanical Engineering
University of Zaragoza

The methodology of Quality Assurance of Project activities is based on regular progress check against the time-table, and list of milestones and proposed quantifiable and specific deliverables in each Project task. These are in detail are described in the "Logical Framework Matrix (LFM)", "Workplan for Project" years 1-3 and "Workpackages description".

The results of activities are evaluated and classified as "successfully completed", "partially completed" and "not completed" depending on the level of achieving deliverables. Such evaluation takes place first during communications between the coordinator and the team and then in communications between members of the Project Executive Committee. When activities are evaluated and classified as "partially completed" and "not completed" then

contingency measures are identified and deployed to resolve the problems.

In the run-up to Project Meetings, the advice and recommendation on the proposed course of actions are sought from External Evaluators of the Project.

Finally, all the above problems are discussed during Project Meetings between members of the Project Executive Committee, taking into account the recommendation of the External Evaluators of the Project. Such Project meetings take place every 3-4 months.

For rapid resolving of the problems, the corresponding arrangements should be made by UNIVPM so that the Coordinator could visit the Partner University to promptly help them to resolve problems affecting the progress in the project activities and its QA Plan.

Part 4. Application of Quality Assurance and Quality Enhancement to the Project modules

Policy and procedures for quality assurance

The project will adhere to all quality assurance policies in place at the institution of delivery as a minimum requirement. Further requirements as laid out in this manual will be followed unless local conditions make this pedagogically impractical, at which point substitution of alternative measures must be given full consideration.

The academic responsible for the administration of the module will be responsible for day-to-day quality assurance and communication to the Department/Faculty, delivering the corresponding programme.

The quality assurance procedures will stress the value of quality assurance in fostering quality enhancement, which will include all stakeholders, academic, students and employer.

Approval, monitoring and periodic review of modules and awards

The modules will all be subject to the local approval process, Departmental, Facultative prior to implementation.

The approved modules will be described within a Programme Specification Document, which will set out all key information relevant to the module/s in a format that is suitable for a reader who may wish to assess this information as a potential student or a potential employer of the graduates of the programme.

The Modules Specification Document will include information under the following headings;

- Full name and level of award and any administrative or institutional

registration code

- Mode and location of delivery and mode of attendance
- Date of approval and dates of external review if applicable
- Educational aims of the module
- How students are supported in their learning, skill and professional development
- The module learning outcomes and a mapping of how these are attained
- Module teaching, learning and assessment strategy
- Award criteria, including any interim awards
- Module selection procedure
- Log of changes derived from the internal review process

Each module will be subject to periodic review, an internal review for assurance monitoring and to foster enhancement and external review to support assurance and to provide external benchmarking of standards.

The internal review will be performed annually, and the process will consider all aspects of the module against its aims and as a part of the programme and the articulated academic standard of the award.

An annual internal review will be conducted by a programme committee review meeting. The committee will consist of the academic responsible for the administration of the module, all academics leading constituent modules of the programme. The student representation from the current cohort is desirable.

The academic responsible for the administration of the module will seek guidance from actual and potential employers of graduates as to the current performance of the module, it aims, and structure.

Outcomes of the Annual Programme Review process will be communicated to all students.

Assessment of students

Assessment approaches must be able to

- demonstrate and evidence the attainment of individual students
- grade or rank students with respect to the pass/fail threshold
- diagnose an individual student's strengths and weaknesses
- provide students with feedback
- provide a profile of what the student has learnt
- align learning activities, assessment tasks and learning outcomes
- enable detection of academic misconduct

The summative assessment of the module will only be concerned with the published learning outcomes of that module, duplication of assessment should be avoided, and grading criteria made available to students prior to commencement of the assessment task. The extensive use of formative assessment to support independent learning and the students' self-evaluation is to be encouraged with summative assessment retained for high stakes assessment at the end of modules. The use of Authentic Assessment approaches is to be encouraged to assure a deeper understanding and professional development. To further assist student understanding of attainment and also to facilitate transparency and external review, all assessments will contain a statement to indicate the threshold level for a Bachelor or Masters levels.

Cognitive/Intellectual skills;

Analysis	Honours graduate	for new situations, the student will be able to undertake an appropriate analysis using standard methods of numerical analysis to draw logical conclusions
	Masters graduate	advanced analysis of complex situations possibly employing incomplete of contradictory data by the use of appropriate engineering tools and methodologies will be presented as justifiable outcomes
Synthesis	Honours graduate	from independent research, the student will apply ideas, information and data to unfamiliar engineering problem-solving situations
	Masters graduate	the student will interpret abstract and multidisciplinary information and data to provide a reasoned and critically aware solution to complex engineering problems
Evaluation	Honours graduate	using data from the student's own research, the significance, reliability and validity may be critically assessed to support derived conclusions or recommendations
	Masters graduate	based upon a theoretical or conceptual understanding, the student may critically evaluate research, information an data and support an argument within the wider context of

		science and engineering.
Application	Honours graduate	appropriate knowledge and skills may be applied to complex engineering or design problems
	Masters graduate	complex and ill-defined engineering problems may be solved with initiative and originality with decisions reached in unpredictable situations for justified engineering solutions
Key/Transferable skills		
Self-evaluation	Honours graduate	may, through self-reflection, identify actions required to overcome weaknesses and complement strengths
	Masters graduate	self-reflection may be applied to plan their own learning needs for personal and professional liability
use of information and resources	Honours graduate	is able to select and source own learning and research materials with limited guidance
	Masters graduate	able to undertake comprehensive research tasks with minimal guidance in a timely manner for both directed and independent study
Honours graduate	Honours graduate	complex problems are solved through the critical application of appropriate methods in stages to reach original solutions
	Masters graduate	complex problems which may contain incomplete or ambiguous information are solved independently through the application of advanced methods and tools
Communication	Honours graduate	complex technical information is presented in an effective and professional manner which may support a detailed and coherent debate
	Masters graduate	complex technical information and numerical data are presented for academic and professional debate with confidence
Learner skills	Honours graduate	working effectively in a range of situations through self-review and able to undertake a range of roles within a group under a range of constraints
	Masters graduate	able to undertake complex tasks independently as a self-learner and whilst working effectively in a group to show an understanding and ability for working with others

including constructive negotiation and conflict resolution

All assessment practices must be published, equitable and subject to review beyond the academics conducting the assessment.

Assessment loading and scheduling must be laid out for students in a document prepared by the academic responsible for the administration of the programme to support the student in taking responsibility for planning their own learning.

Practical recommendations on assessment procurers

If possible to introduce ***Written Exam****, marked anonymously (for Partner Universities, where this method of student knowledge assessment is not primary one).*

Examination paper preparation

In accordance with the agreed time-table, the call for papers to be set by the examiners will be issued. Examiners preparing individual papers will have the following roles:

Module Tutor is responsible for coordinating the preparation of the whole module exam paper. The examination should be arranged in such a way that it assesses identified learning outcomes of the module. Jointly with the other examiners for the module paper, the Module Tutor establishes the form, balance and division of questions between topic areas, the wording of the exam paper rubric.

All examiners are responsible for the setting and marking of individual questions, as agreed with the Module Tutor. The examiner will prepare question/s and answer/s with indication of the marking scheme both on the question and on the answer sheets.

Upon completion, the Module Tutor will supply the administrator responsible for the programme with the completed paper whereupon the administrator will send all programme examination papers to the External Assessor for approval.

Marking procedures

Marking should be anonymous. Providing written qualitative comments in answer books should be avoided as the script may be seen by the candidate and an appeal launched. These include comments such as "superb answer" or "fails to understand the question" etc. Numeric marks should be provided only.

Script Preparation

The Module Examiner for a paper shall arrange a meeting with the other examiners before the exam date to agree on a rota for first and second marking over the given dates. At this meeting, it should be ensured that each examiner clearly understands the marking procedures to be followed.

First Marking round

For each candidate, the first marker shall for each question attempted:

a) indicate in the margin of each page of the answer submitted has been seen and read.

b) write in distinctive ink (e.g. red) those marks that have been awarded for sections of the answer according to the marking scheme.

c) where appropriate, indicate the main sources of error;

d) at the foot of the final page of the answer, total the marks awarded in accordance with the total available mark as indicated on the mark sheet and circle it.

e) transfer the total mark to the front cover of the script.

Second Marking

This should normally be carried out by another examiner of the paper, and he/she should;

a) check the marking for consistency with the model answer and marking scheme. The marker should ensure that the marks awarded range from 0 to the maximum mark available for the part of the question.

b) check that all work relating to the question has been seen and marked by the first examiner.

c) check that all pages of all the scripts relevant to the question or questions being checked carry marginal marks to indicate that they have been seen and checked with a colour not previously used (e.g. green).

d) check the addition of marks by the first marker, referring any apparent errors to the first marker for correction.

e) check the transfer of the marks to the front of the script are correct.

When all questions have been first and second marked, the scripts should be returned to the paper's Module Examiner, who will complete the finalisation of the marks.

Coursework Assignments

The Assignment Developer will provide the Moderator with a draft of the assignment and its marking scheme for approval. The Moderator will check that asks in the assignment are well balanced, can be clearly understood, and that marks allocated to sections of the assignment are appropriate. The assignment can only be issued to students after it has been approved by the Moderator.

a) All students taking the course will be notified of arrangements to incorporate marks for coursework at the start of the course. This will normally be done during the first session of the

course. This notification will include information on the number of assignments to be undertaken and the percentage allocation of marks to each assignment. Additionally, an approximate indication of the timing of the assignments will be given at the first session of the course.

b) Each assignment shall normally be distributed at one of the course sessions.

c) The paperwork for each assignment will clearly indicate:

i. The course to which it relates;

ii. The deadline for submission;

iii. The procedure of submission (place, time, person);

iv. The form of the submission, including advice regarding the regulations for academic misconduct

v. An estimate of the time required to complete the assignment;

vi. A warning that late submissions will not be accepted;

vii. A statement indicating the penalties for non-compliance with the stated requirements, e.g. on page limits;

viii. The date on which the marked work will be returned to the students;

Usually, electronic receipts are issued, indicating work has been submitted.

d) The work submitted as an assignment is marked by the first examiner, and then is checked by the Module Moderator, who will sample a minimum of 6 assignments. The second examiner will ensure that the work has been fairly and consistently marked and that the feedback given to the student is of good quality and useful

Thesis assessment

At the prescribed time, each student is required to submit two hard copies of their thesis plus an electronic copy of his/her work in pdf format and a progress log book.

The pdf file should be checked using plagiarism software.

Each project shall be assessed in an oral examination which shall normally take about 45 minutes. The oral examination shall be conducted by two examiners, with an oral examination Chair being present to oversee the examination. The first examiner is the project supervisor, and the other is another member of staff. The assessment is based on the module Learning Outcomes typified by several elements such as Planning; Demonstrating initiative and bringing Ideas; Understanding of the elements of research work conducted; Oral Performance during the exam and achievement.

Procedures for oral examination chairmen/women

a) The Chair is responsible for ensuring that the student is treated fairly and that the oral examination runs to time.

b) The Chair, if the examiners' grading is significantly different from the Chair's view, he/she shall ensure that the examiners are aware of the difference and that they can justify the marks awarded.

c) If there is a serious disagreement between the examiners such that the Chair may have to rule that the supervisor's assessment must take precedence, then before doing so, the Chair shall suggest an adjournment to give the examiners time to reflect on the matter. When the report form is completed, the nature of the disagreement should be described.

d) If there is an adjournment for any reason, the examiners must not discuss the examination with anyone else, or even between themselves in the absence of the Chair.

Procedures for supervisor and second examiner before and during an oral examination

After dissertations have been submitted, copies will be distributed to both examiners.

a) Prior to the oral examination, the second examiner should read the dissertation carefully and award a grade for the quality of the report. Additionally, the second examiner should prepare a list of questions to ask the candidate during the oral examination, to test the candidate's understanding of the work and of its relevance and value, and to identify the achievements. The examiner should mark any errors in the dissertation and note whether all instructions given to the student have been observed. The second examiner will reveal their grade to the supervisor after the oral examination is completed.

b) The second examiner should not discuss the work with the supervisor before the examination.

c) Prior to the oral examination, the first examiner (supervisor) should award a grade for the degree of planning and the initiatives and ideas made by the candidate. Additionally, the supervisor should read the dissertation and prepare a set of his questions for the oral examination, to test a deeper understanding of the candidate. The supervisor also should mark any errors. The supervisor shall not reveal his grades to the second examiner until the oral examination is completed.

d) Before the oral examination, the Chair will collect the grades from both examiners and ask if there were any special or mitigating circumstances during the project work.

e) During the oral exam, each examiner will have 20 minutes to test the knowledge of the candidate. After the detailed questions, the Chair will ask the candidate if the work has been covered adequately during the discussions. After completion of the oral

exam, the Chair will ask the candidate to leave.

f) After the oral examination, both examiners comment on the quality of the dissertation, understanding and oral performance of the candidate. The supervisor and second examiner then should move towards consensus grades for the dissertation, the understanding, the oral performance and the achievements and work out the final mark.

Quality assurance of teaching staff

The academic responsible for the administration of the programme will ensure that all teaching staff are qualified and competent to deliver the programme. All staff will engage with internal and external review processes as part of their self-evaluation and quality enhancement. All staff will share good practice and seek to employ and evaluate up-to-date approaches to learning and teaching through a range of activities which will be expected to include;

- workshops, seminars and training courses
- Peer observation
- pedagogic conferences and dissemination of engineering education research journal findings

All teaching staff will be involved in the module and programme review process, which will include student consultation.

Learning resources and student support

To support learning, the teaching staff and students need access to appropriate and up-to-date resources, both physical and electronic.

Physical resources include;

- teaching, lecture and seminar rooms of size and layout which support the approaches to teaching being employed
- laboratories (including computer laboratories) and workshops to underpin taught classes and projects work
- dedicated space for dissertation projects, suitably located for collaboration with staff research activity
- library and learning support facilities
- student support facilities

Electronic resources include;

- Virtual Learning Environment, or equivalent system preferably integrated with electronic library materials and learning support software

- specialist engineering design and analysis software tools preferably recognised commercial packages

- general software for producing text, diagrams and graphs

- electronic library resources such as e-books and journals

Student support should seek to meet the pastoral and spiritual needs of the students.

Information systems

The academic and administrator responsible for the administration of the programme will maintain all programme documents, including a record of the internal review process and all revisions. The administrator responsible for the administration of the programme will maintain all student records from the point of application to award and derive appropriate data formatted for the internal review of the effectiveness of the programme.

Research-informed teaching

Students should have an opportunity to access the benefits of exposure to teaching informed by research. Such teaching can take many forms, including the fundamental and applied research feeding curriculum development. An understanding of the research process – asking the right questions in the right way, conducting theoretical investigations and experiments, and collating and evaluating information – must be a key part of the curriculum.

As the elements of Research-Informed Teaching, the following activities will be incorporated into teaching:

- The active involvement of high-level researchers in curriculum development;
- The curriculum will provide students with research training and knowledge;
- The curriculum will emphasise students undertaking inquiry-based learning;
- The curriculum will emphasise learning which incorporates students writing and discussing papers, essays and research case studies around subject content;
- The curriculum will emphasise teaching processes of knowledge construction in the subject;
- The curriculum will emphasise the research-oriented module, namely R &D project with dissertation, in which student will take part in independent research guided by staff;
- The curriculum will emphasise the active self-learning process through the use of library recourses (subject journal publications) and participation in research seminars, research poster presentations and conferences as a part of developing research presentation skills.

Introduction of assessment of courses by students

Assessment of courses by students will be a part of Skybelt Project. The special course questioner will be developed to reflect the students feedback on the quality of teaching materials, content and professional usefulness of didactic materials, with a section provided for students suggestions on improving the course and/or its components.

The preference would be to provide students with an opportunity to fill in such the questioner using ITS facilities.

The major principle in gathering students feedback is the provision of anonymity.

Questioners will be issued to students after examinations are completed on the course.

Part 5. The organisation of Seminars for Partner University Staff by QA Departments of EU Universities

To share good practices in education between partner and EU universities, special 2- hour seminars will be organised by the staff of QA Departments of EU Universities.

Such seminars will be planned as a part of every meeting held at EU Universities.