



Faculty of Computer and Information Systems
Islamic University of Madinah

Program Quality Assurance
Manual

Masters of Science in Data
Science

1446H





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1. Introduction

Quality assurance is a cornerstone of excellence in higher education, particularly in dynamic and rapidly evolving fields like data science. The **Master of Science in Data Science** program at the **College of Computing and Information Systems (FCIS)** is committed to maintaining the highest standards of academic quality, institutional effectiveness, and continuous improvement. This commitment is aligned with the **Quality Assurance System Guide of the Islamic University (1445 AH)** and supports the strategic goals outlined in **Saudi Arabia's Vision 2030**, especially those related to advancing education, innovation, and national competitiveness.

This manual serves as a guiding document for implementing, monitoring, and enhancing quality assurance practices within the MSc in Data Science program. It provides a clear framework for maintaining academic integrity, meeting accreditation requirements, and fostering a culture of quality that engages faculty, students, administrators, and stakeholders alike.

Grounded in the principles of **Total Quality Management (TQM)**, the manual emphasizes shared responsibility, evidence-based decision-making, and continuous development across all levels of the program. By applying the standards and procedures outlined herein, the program ensures that its graduates are well-prepared to meet the demands of the data-driven economy while contributing meaningfully to research, industry, and society.

The FCIS College's approach to quality is built on a set of foundational pillars, ensuring that efforts are focused, measurable, and sustainable:

a) Stakeholder Satisfaction

Delivering high-quality services and learning experiences that meet the expectations of students, faculty, and external partners. Feedback mechanisms, such as surveys and performance reviews, are routinely analyzed to identify areas for enhancement.

b) Inclusive Engagement

Fostering a sense of ownership and shared responsibility among all college members. Quality is everyone's concern, and each individual is accountable for executing their tasks with excellence and integrity.

c) Assessment and Metrics

Regular evaluation using clearly defined performance indicators to measure progress, highlight strengths, and address gaps in both academic and operational activities.

d) Continuous Improvement

Creating a dynamic system that prioritizes ongoing development. This includes evaluating current practices, setting goals based on strategic priorities, implementing action plans, monitoring execution, adjusting as needed, and assessing outcomes to close the quality loop.



2. Key Terms in the Guide

Quality:

According to the Oxford Dictionary, quality refers to a high degree of excellence or value. The American O.D.I. institution, which specializes in training and preparing companies to meet quality standards, defines quality as “*doing the right things at the right times.*”

The standard definition of quality:

The processes that ensure adherence to international quality management standards and the necessary measures to align performance across all university activities with specific standards set by the National Center for Academic Accreditation and Evaluation and international accreditation bodies. It includes continuous monitoring and appropriate improvement actions to ensure actual performance results align with desired goals and outcomes, aiming to achieve the highest level of stakeholder satisfaction according to Total Quality Management (TQM) standards.

Total Quality Management (TQM):

The use of advanced and diverse analytical and statistical methods to achieve the best results, involving all elements of the system (inputs, processes, and outputs) and managing them to achieve the required quality.

Quality Assurance:

A process to ensure that the institution meets the required standards and criteria necessary to achieve its goals and deliver outcomes that satisfy labor market demands and community needs.

Quality Control:

Techniques and practical activities used for continuous inspection of all aspects of the activity.

Quality Policy:

A document that expresses the organization’s quality objectives.

Program Accreditation:

Recognition by the National Center for Academic Accreditation and Evaluation that an academic program meets the required quality assurance and accreditation standards.

Evaluation:

The process of measuring performance quality across various activities and taking appropriate actions based on the results to achieve continuous improvement.



Comprehensive Periodic Evaluation:

A process to assess performance quality in all activities based on institutional or program accreditation standards issued by the Education and Training Evaluation Commission.

Performance Indicators:

Tools used to assess the quality and monitor the performance of educational institutions or academic programs.

Continuous Improvement:

A series of actions undertaken by quality management to review and assess internal processes and practices, aiming to improve and enhance their efficiency while minimizing errors through continuous changes.

Quality Cycle:

A set of interrelated, sequential, and repetitive processes aimed at improving and developing performance.

Primary Quality Cycle (Major, Comprehensive):

Focuses on comprehensive performance improvement at the institution or program level.

Secondary Quality Cycle (Minor, Partial):

Aims to improve performance in a specific practice at the institution or program level.

Closing the Quality Cycle:

Completion of the process according to the planned sequence.



3. Closing the quality cycle

Closing the quality cycle is one of the most critical aspects to be considered in quality processes, as it represents the continuity of improvement and development at all levels without interruption. The quality cycle is classified into two types:

1. **Primary (Major, Comprehensive) Cycle:**
Aims for comprehensive performance improvement at the program level.
2. **Secondary (Minor, Partial) Cycle:**
Aims for performance improvement in a specific practice at the program level.

Components of the Quality Cycle:

1. Planning
2. Realizing
3. Inspection and Assesement
4. Improvement

What is meant by Closing the Quality Cycle?

It refers to the completion and conclusion of the process according to the planned sequence. It does not mean stopping the work; rather, it indicates the end of one cycle and the continuation of work by starting the process anew. Improvement requires a continuous cycle of planning, execution, assesment, and improvement ensuring the cycle continues without interruption.

Figure 1 illustrate the inspection, assesment, and improvement cycle in the program. The cycle starts with collecting and analyzing data to identify strengths, areas for improvement, and priorities. Simple improvements are implemented annually, while comprehensive improvements are planned and executed every five years. After gathering all improvements, a comprehensive plan is prepared and approved, ensuring the continuity of improvement efforts. This process emphasizes ongoing assesment and the systematic closing of the quality cycle to maintain and enhance educational standards.

Figure 2 illustrates the PDCA Cycle (Plan-Do-Check-Act) applied in academic quality management. The process begins with Plan, involving the development of program and course descriptions. The Do phase focuses on weekly execution of planned activities. In Check, course and program reports are evaluated to assess performance. Finally, the (Re)Act phase involves modifying and improving programs and courses based on the evaluation results, ensuring continuous improvement. This iterative cycle promotes effective quality assurance and alignment with educational goals.

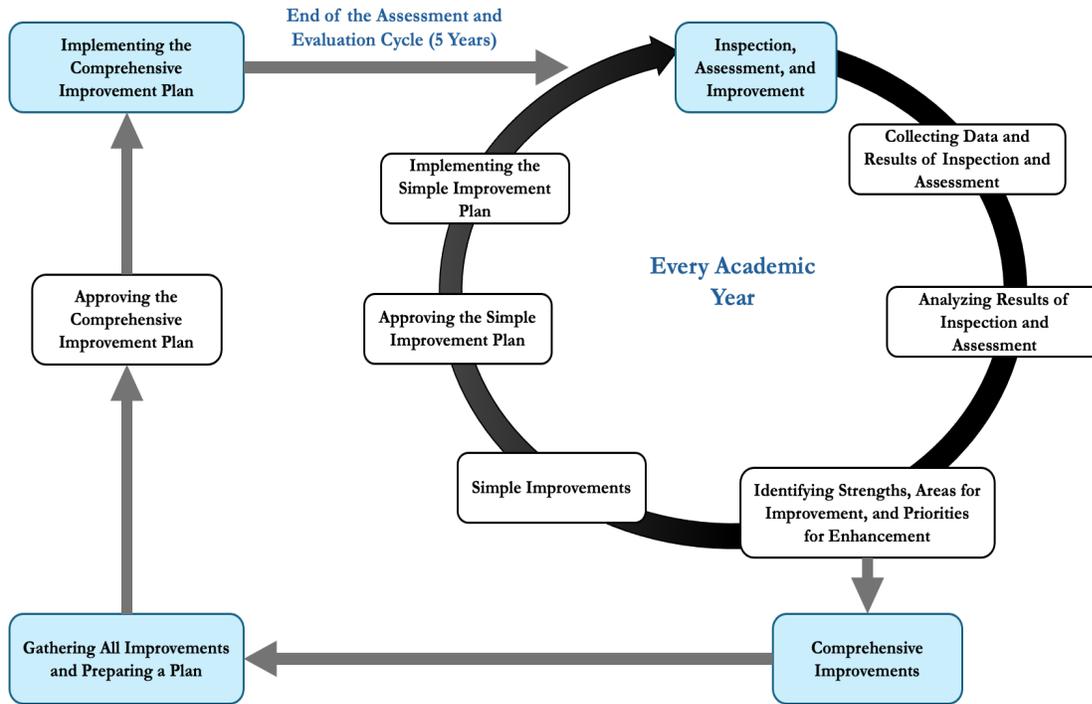


Figure 1. Continuous Improvement Cycle for Academic Quality Management

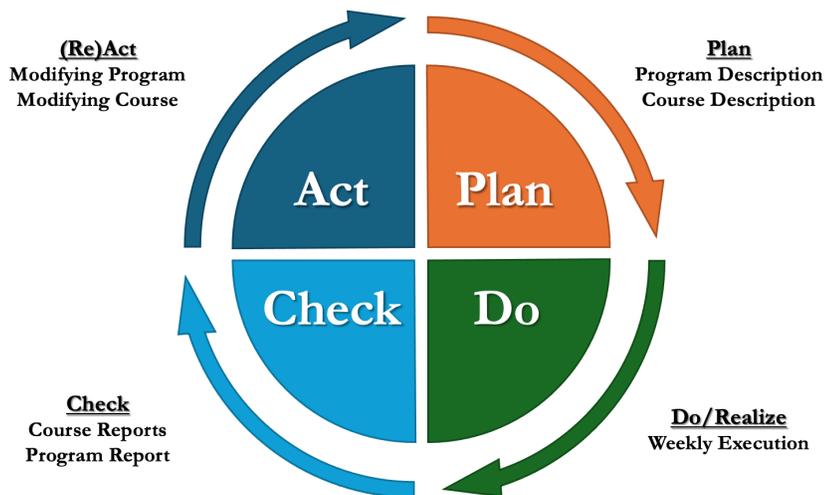


Figure 2. PDCA Cycle for Academic Quality Management



Figure 3 represents the Academic Quality Assurance Workflow. It illustrates a two-cycle process for evaluating and improving academic programs. The First Cycle involves the Course Instructor/Course Coordinator, the Quality Assurance Unit, and the Department Council, where course reports and improvement recommendations are reviewed. The Second Cycle progresses to the Curricula and Planning Committee, College Council, and Higher Committee for Curricula and Study Planning at the university level, culminating at the University Council. Recommendations are approved, and modifications to programs or references are made. A copy of the final approval is sent to the Deanship of Quality and Academic Accreditation for documentation.

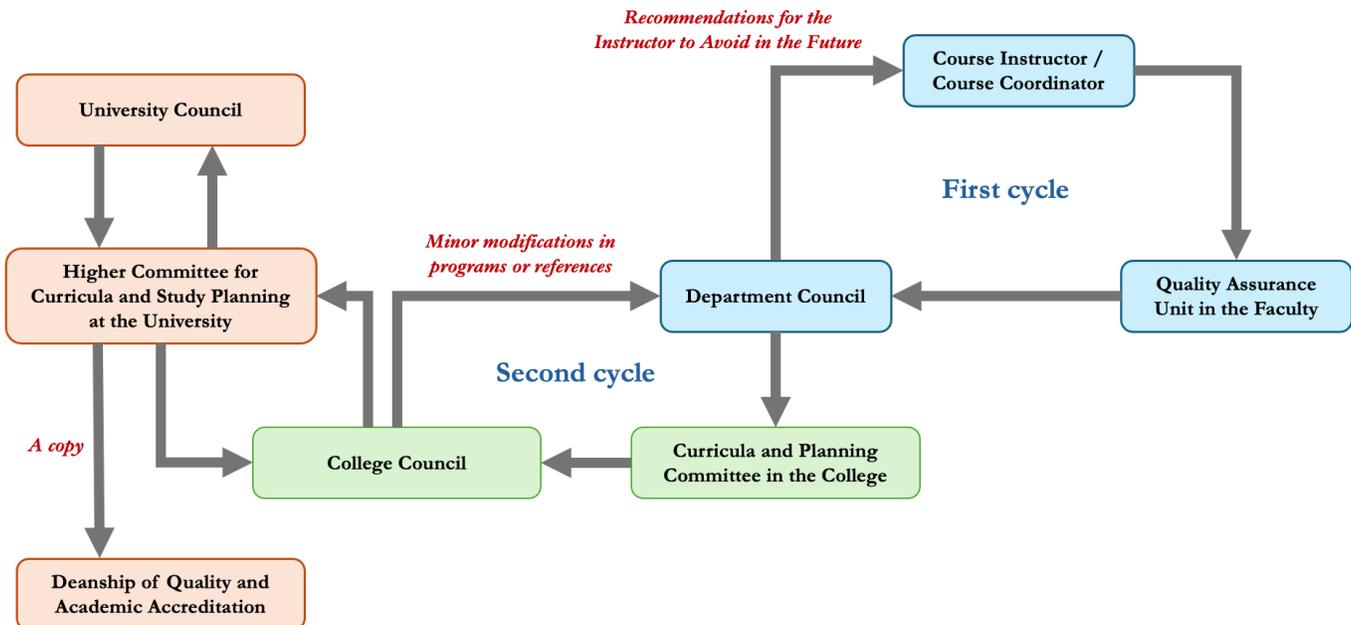


Figure 3. Academic Quality Assurance and Improvement Workflow



Quality process flow and required documentation for closing the quality cycle in the college:

No.	Processes	Cycle (1) Scientific Department			Cycle (2) College			Cycle (3) Deanship of Development and Quality			Cycle (4) Curricula and Planning Committee at the University / Permanent Committee for Graduate	Cycle (5) University Council	Essential Requirements to be Met	Closing Processes
		Quality Committee	Curricula and Planning Committee	Department Council	Curricula and Planning Committee	Quality Committee	College Council	Learning and Teaching Unit	Reports Unit	Quality Council				
1	Mapping Program Learning Outcomes to University Graduate Attributes	✓				✓		✓					Completion of required forms for mapping	Approval of the form
2	Learning Outcomes assessment Plan	✓		✓									Plan according to the program cycle	Department Council minutes approving the plan
3	Learning Outcomes assessment Report	✓		✓									Report on the implementation of the plan including improvement priorities	Department Council minutes approving the report
4	Operational Plan for the Program	✓		✓									Operational plan according to specific indicators	Department Council minutes approving the plan
5	Research / Community Plan for the Program	✓		✓									Research plan according to specific indicators	Department Council minutes approving the plan
6	Course Reports		✓	✓									Course reports according to the NCAAA template + comprehensive report on what was included in the course reports	Department Council minutes approving the reports and improvement recommendations

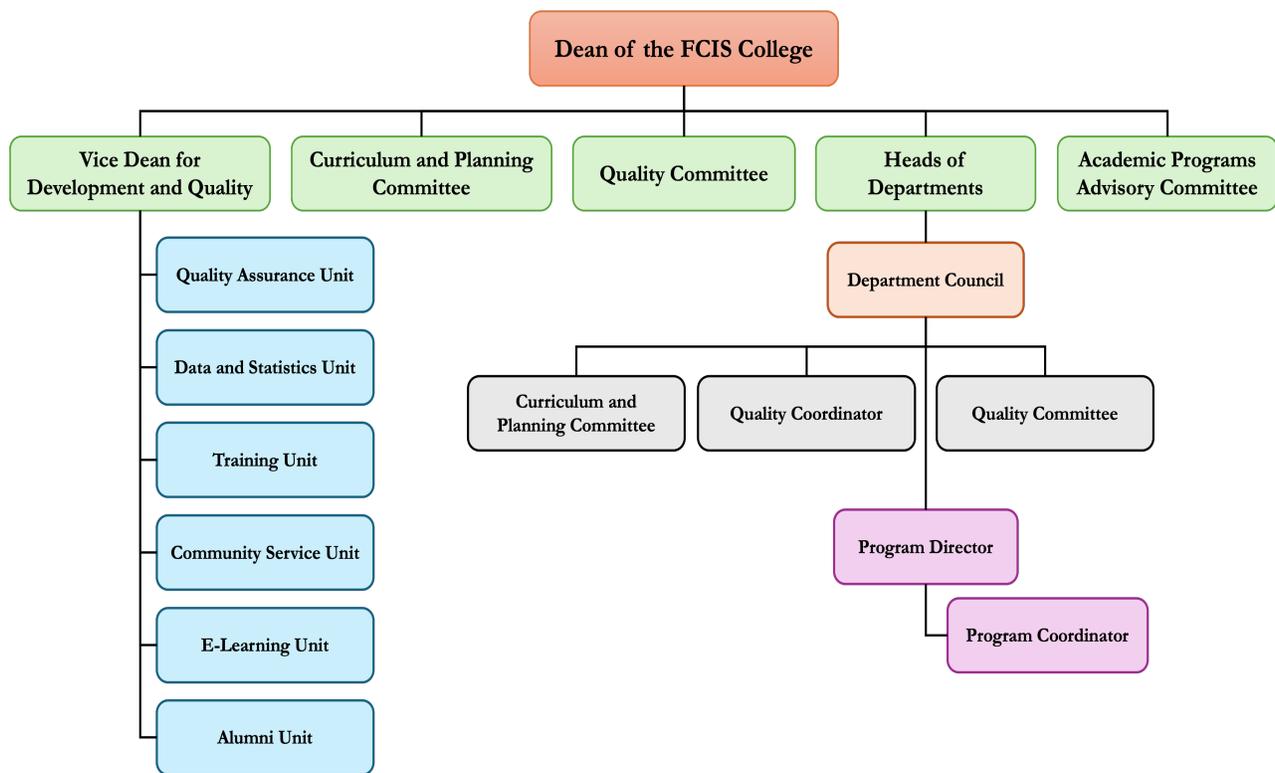


No.	Processes	Cycle (1) Scientific Department			Cycle (2) College			Cycle (3) Deanship of Development and Quality			Cycle (4) Curricula and Planning Committee at the University / Permanent Committee for Graduate	Cycle (5) University Council	Essential Requirements to be Met	Closing Processes
		Quality Committee	Curricula and Planning Committee	Department Council	Curricula and Planning Committee	Quality Committee	College Council	Learning and Teaching Unit	Reports Unit	Quality Council				
7	Program Report		✓	✓	✓		✓			✓			Program report according to the NCAAA template fulfilling all elements	Minutes of the Development and Quality Deanship Council approving the report and presenting development proposals
8	Description of a New Program / Development		✓	✓	✓		✓			✓	✓		Program specification according to the NCAAA template and the completion of all required forms	Minutes of the University Council approving the program specification
9	Description of Courses for a New Program / Development		✓	✓	✓		✓			✓	✓		Course specifications according to the NCAAA template with the various approval minutes	Minutes of the University Council approving the course specifications of the program
10	Program Self-Study	✓		✓		✓				✓			Self-study report according to the NCAAA template	Development and Quality Deanship Council minutes approving the self-study report
11	Program Improvement Plans	✓		✓		✓							Improvement plans according to a specified timeline	Minutes approving the improvement plans
12	Implementing Program Improvement Plans	✓		✓		✓							Reports on the progress of improvement plans	Minutes approving the progress reports



4. The key roles of the FCIS members in ensuring quality

The following diagram outlines the quality management structure at FCIS, led by the Dean and supported by the Vice Dean for Development and Quality, various quality units, and key committees. Department Councils work with coordinators and committees to oversee curricula and quality processes. Program Directors and Coordinators ensure the implementation of quality standards at the program level.



In the following, we detail the roles and responsibilities of the main unit and committee in the quality management structure.

The College Dean:

1. Supervising quality assurance processes in the college.
2. Working to achieve the university's overarching goals and policies.
3. Overseeing the development of the college in administrative, academic, and research aspects.
4. Supervising the implementation of the university's strategic plan projects within the college.
5. Enforcing quality systems, regulations, and academic accreditation standards.



6. Submitting periodic reports on quality assurance processes in the college to the university president.

The College Council:

1. Proposing or modifying study plans in coordination with departments.
2. Proposing curricula, textbooks, and references for departments.
3. Approving annual academic program reports.
4. Monitoring the progress of programs under accreditation and ensuring quality standards are met.
5. Encouraging and coordinating scientific research across departments and promoting its dissemination.
6. Proposing internal regulations for the college.
7. Approving quality-related plans, such as measuring learning outcomes and performance indicators.
8. Addressing issues referred by the university council or its leadership.

The Quality Committee in the College:

1. Developing quality and accreditation policies for the college.
2. Approving the plan to spread quality culture and monitoring supportive activities.
3. Adopting the operational quality assurance plan.
4. Discussing training and development plans for faculty members.
5. Reviewing and discussing the college's annual report.
6. Preparing improvement and development plans.
7. Reviewing and discussing survey analysis reports.
8. Monitoring the work of departmental quality coordinators.
9. Planning visits by external reviewers for academic accreditation.

The Curriculum and Planning Committee in the College:

1. Reviewing and proposing study plans and academic programs from scientific departments for development and modification.
2. Addressing feedback from reviewers and making suitable recommendations.
3. Preparing and proposing updates to study plans and programs.
4. Ensuring program specifications meet quality standards and accreditation requirements.



5. Conducting benchmarking, periodic evaluations, and comprehensive reviews of college programs.
6. Studying and providing feedback on reports and proposals related to study plans and programs.
7. Recommending program requirements, course specifics, and identifying external reviewers.
8. Organizing workshops and discussion sessions to develop and update programs.
9. Ensuring study plans align with the national qualifications framework and university regulations.
10. Reviewing all matters related to study plans and programs referred by scientific councils and specialized committees.

The Academic Programs Advisory:

1. Assisting in developing a future vision for academic programs and resolving issues.
2. Offering advice on program and course specifications.
3. Participating in defining and updating graduate attributes.
4. Enhancing program efficiency based on labor market needs and proposing promotion mechanisms.
5. Strengthening community partnerships to benefit academic programs.

The College Vice Deanship for Development and Quality:

1. Creating a supportive environment for implementing quality assurance in all departments and units according to the university's quality management system.
2. Organizing internal quality control mechanisms, ensuring clear documentation, and raising staff awareness of their roles and responsibilities.
3. Verifying that programs and courses comply with quality standards and engaging all staff in the process.
4. Ensuring that all departments and units adhere to the university's quality management system.
5. Submitting periodic reports on planning, implementation, and quality monitoring to the Deanship of Development and Quality.
6. Participating in internal reviews and annual evaluations, preparing related documentation in line with the university's quality management system.
7. Ensuring that the college conducts annual reviews, responds to reviewers' recommendations, and develops actionable improvement plans.
8. Following up on prioritized improvement initiatives throughout the year.



9. Preparing the annual self-assessment quality report and submitting it to the Deanship of Development and Quality.
10. Reviewing outputs from the annual evaluation and including major improvement initiatives in the faculty's annual report.
11. Utilizing all guidance and support provided by the Deanship of Development and Quality.

The Vice-Dean for Development and Quality:

1. Submitting reports to the faculty council on practices eligible for academic accreditation.
2. Chairing the Quality Committee at the faculty level.
3. Acting as deputy chair of the Curricula and Planning Committee.
4. Supervising the Learning and Teaching Quality System (Itqan).
5. Promoting quality culture through lectures, workshops, and updates on accreditation and quality practices.
6. Representing the faculty in the Council of the Deanship of Development and Quality.

The Quality Assurance Unit:

1. Promoting and strengthening the culture of quality within the college.
2. Supporting programs to meet accreditation requirements and providing necessary assistance.
3. Communicating the college's vision, mission, and objectives to all stakeholders.
4. Monitoring the closure of the quality cycle in academic programs.
5. Activating and regularly updating the internal quality assurance system in the faculty.
6. Following up on the approval and archiving of annual program reports.

The Data and Statistics Unit:

1. Collecting and classifying data related to quality assurance.
2. Designing, distributing, and analyzing surveys for all stakeholders (faculty, students, staff, and employers).
3. Measuring and analyzing performance indicators for programs.
4. Preparing periodic reports on performance levels and stakeholder satisfaction.

The College Vice-Dean for Academic Affairs:

1. Supervising the educational process for undergraduate and postgraduate students.
2. Implementing approved academic policies and regulations.
3. Overseeing the preparation of student activity and guidance plans.
4. Monitoring the implementation of student activity and guidance plans.



5. Coordinating and supervising various extracurricular activities within and outside the college.
6. Submitting periodic reports to the Dean on the progress of relevant units.

The Department Councils:

1. Approving or modifying study plans.
2. Discussing and adopting program learning outcomes and performance indicators.
3. Reviewing and approving annual program reports.
4. Approving program improvement plans.
5. Approving programs, curricula, textbooks, and references within the department.
6. Proposing new programs and related developmental projects.
7. Recommending the formation of exam moderation committees.
8. Recommending faculty participation in local and international conferences and seminars.
9. Recommending the recruitment of qualified external faculty members for teaching.

The Department Heads:

1. Evaluating the performance of faculty members, teaching assistants, and lecturers in the department.
2. Supervising the preparation and implementation of the department's plan.
3. Monitoring grade submission and ensuring accuracy in the electronic grading system.
4. Ensuring faculty members fulfill their responsibilities, such as office hours and exam monitoring.
5. Submitting periodic reports to the Dean on departmental activities and challenges.

The Program Coordinators:

1. Executing tasks assigned by the curriculum committee or program director.
2. Monitoring program implementation through the quality management system (Etqan).
3. Supporting course coordinators and providing necessary assistance.
4. Preparing and presenting the program's annual report to the quality committee.
5. Presenting the annual report for independent review of the program.
6. Examining similar programs and conducting benchmarking before and after program approval.
7. Collecting suggestions and improvement priorities related to the program and presenting them to the Quality Committee for review and feedback.



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8. Addressing matters related to study plans and program development referred by the department council or curriculum committee.

The Quality Coordinators:

1. Promoting quality culture and accreditation requirements within the department in coordination with the development and quality unit.
2. Collaborating with departmental subcommittees for development and quality activities.
3. Monitoring quality-related activities in the department and addressing challenges with the department head.
4. Providing support to faculty members regarding quality and development.
5. Representing the department in quality meetings and following up on recommendations.
6. Ensuring the availability of documents required for academic accreditation.
7. Completing tasks assigned by the Vice-Dean for Development and Quality.



5. Timeline for Quality Activities and Processes

No.	Processes	Process Cycle	Execution Time		Responsible Entity	Notes
			Start Time	End Time		
1	Comprehensive periodic evaluation according to program accreditation standards (including review of the mission, objectives, learning outcomes, curriculum, teaching strategies, and assessment methods)	According to the program cycle	End of the last year of the program cycle	End of the first semester of the following year	Quality Unit in the Department	Updated program specification + updated course specifications approved by the specified councils and committees in the Academic Program Preparation Guide + evaluation according to program accreditation standards, ensuring all accreditation requirements, including the self-study, are provided based on the nature of each program
2	Program consistency report with the National Qualifications Framework	With each periodic evaluation of the program or when there is a change in the program plan and learning outcomes	End of the last year of the program cycle	End of the first semester of the following year	Quality Unit in the Department	According to the NCAAA template
3	Performance indicators report and benchmarking	Annually	End of the academic year	End of the first month of the following year	Quality Unit in the Department	Performance indicators and benchmarking report with detailed analysis
4	Learning outcomes assessment plan	A comprehensive plan aligned with the program cycle, from which a semester-based plan is derived	After the completion of the previous cycle	Before the start of the new cycle	Quality Unit in the Department	A plan aligned with the program cycle, accompanied by an annual implementation plan with defined indicators
5	Learning outcomes assessment plan report	Each semester	End of the semester	Second week of the following semester	Quality Unit in the Department	Detailed report on learning outcomes with statistics and improvement suggestions
6	Operational plan for the program	Every five years, from which an annual plan is derived	Throughout the academic year		Quality Unit in the Department	Operational plan for each year with defined indicators
7	Research plan for the program	Every five years, from which an annual plan is derived	Throughout the academic year		Quality Unit in the Department	Operational plan for each year with defined indicators
8	Community service plan for the program	Every five years, from which an annual plan is derived	Throughout the academic year		Quality Unit in the Department	Operational plan for each year with defined indicators
9	Advising plan in all its forms for the program	Annually	One month before the start of the new academic year	Before the start of the new academic year	Quality Unit in the Department	Operational plan with defined indicators
10	Extracurricular activities plan for the program	Annually	One month before the start of the new academic year	Before the start of the new academic year	Quality Unit in the Department	Operational plan with defined indicators



No.	Processes	Process Cycle	Execution Time		Responsible Entity	Notes
			Start Time	End Time		
11	Training plan for college faculty members	Annually	One month before the start of the new academic year	Before the start of the new academic year	Quality Unit in the College	Operational plan based on actual needs with defined indicators
12	Implementation reports of plans at the program level	Annually	End of the academic year	First month of the following year	Quality Unit in the Department	Detailed progress with statistics and recommendations
13	Course reports	Each semester	End of the semester	Second week of the following semester	Faculty members / Course coordinators	Comprehensive course reports aligned with the NCAAA template
14	Program report	Annually	End of the academic year	First month of the following year	Quality Unit in the College/Department	Program report aligned with the NCAAA template
15	Discussion of program reports in the Development and Quality Council	Annually	Second month of the first semester	Third month of the first semester	Deanship of Development and Quality	Approved minutes with feedback on the report
16	Program opinion polls	Annually	Throughout the year		Development Units in Colleges + Decision Support Center	A comprehensive report including detailed analysis
17	Improvement plans at the program level	Annually	End of the academic year	First month of the following year	Quality Unit in the Department	A timed improvement plan based on specific indicators
18	Achievement reports of improvement plans at the program level	Annually	As specified in the plan		Quality Unit in the Department	Detailed report on the implementation of improvement plans with statistics and recommendations
19	Program introduction guide	With each periodic evaluation of the program or upon major changes in the program	Occurs annually		Quality Unit in the Department	Comprehensive program guide with updates during each periodic review



6. Key Performance Indicator (KPI)

A high-quality educational system must prioritize the evaluation, analysis, and continuous review of performance across all academic units, including the program level. One of the most effective tools for this purpose is Key Performance Indicators (KPIs), which assess the performance of college programs based on various academic functions.

To ensure the effectiveness and quality of its programs, the Faculty of Computer Science & Information Systems (FCIS) adopts Key Performance Indicators (KPIs) at the program level as proposed by the National Commission for Academic Accreditation and Assessment (NCAAA). These indicators represent the minimum required metrics to be periodically assessed. However, academic programs may incorporate additional KPIs if deemed necessary to further ensure program quality and effectiveness.

Academic programs are expected to evaluate KPIs through benchmarking, utilizing appropriate tools such as surveys, statistical data, and other relevant methods, based on the nature and objectives of each indicator. Additionally, for each KPI, the following performance levels must be determined:

Actual performance

- Targeted performance level
- Internal benchmark (reference within the institution)
- External benchmark (comparison with external institutions)
- New target performance level

A comprehensive report should be prepared, detailing the analysis of each indicator, including performance trends, site- and gender-based comparisons, and a precise, objective identification of strengths and areas for improvement to support continuous quality enhancement.

No.	KPIs Code	KPIs	Measurement Methods	Measurement Time
1	KPI-PG-1	Students' Evaluation of quality of learning experience in the program	Surveys, interviews	During the Academic year
2	KPI-PG-2	Students' evaluation of the quality of the courses	Surveys, interviews	During the Academic year
3	KPI-PG-3	Students' evaluation of the quality of scientific supervision	Surveys, interviews	From 2 nd year of the program
4	KPI-PG-4	Average time for students' graduation	Surveys, interviews	During the Academic year
5	KPI-PG-5	Rate of students dropping out of the program	Surveys, interviews	During the Academic year
6	KPI-PG-6	Employers' evaluation of the program graduates' competency	Surveys, interviews	During the Academic year



7	KPI-PG-7	Students' satisfaction with the provided services	Surveys, interviews	During the Academic year
8	KPI-PG-8	Ratio of students to faculty members	Surveys, interviews	During the Academic year
9	KPI-PG-9	Percentage of publications of faculty members	Surveys, interviews	During the Academic year
10	KPI-PG-10	Rate of published research per faculty member	Surveys, interviews	During the Academic year
11	KPI-PG-11	Citations rate in refereed journals per faculty member	Surveys, interviews	During the Academic year
12	KPI-PG-12	Percentage of students' publication	Surveys, interviews	From 2 nd year of the program
13	KPI-PG-13	Number of patents, innovative products, and awards of excellence	Surveys, interviews	During the Academic year

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الجامعة الإسلامية بالمدينة المنورة
(٠٣٢)
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