

Prince Sattam bin Abdulaziz University
College of Engineering
Department of Mechanical Engineering



جامعة الأمير سطاتم بن عبد العزيز
كلية الهندسة
قسم الهندسة الميكانيكية

**College of Engineering
Mechanical Engineering department**

Program: Bachelor's Degree in Mechatronics Engineering

Quality Assurance Manual

1- Introduction.

The academic quality assurance guarantees the continuous improvement of the program through a process of self-evaluation, internal review, and external review. In addition, Academic Quality Assurance ensures excellence in quality practices in teaching and learning as well as in its support services, determines strengths, weaknesses, and corrective actions, implements the different procedures of quality assurances processes, and reports all these activities in a quality reports.

This quality assurance manual serves as a guide for the Bachelor's program of Mechatronics Engineering Department at the College of Engineering. It presents and explains the continuous improvement processes implemented by the program and it contains the different units and their responsibilities to follow and support the academic program. All-important references are included in the appendices

2- Concepts and Terminology.

Vision: These are goals for the future that are out of reach right now and that the college will eventually pursue.

Message: The mission is the overarching objective that can be accomplished by utilizing the available resources, methods and means to attain the vision.

Academic Program: A combination of courses and/or requirements leading to a degree or certificate.

The quality of academic program: Is a way of describing how well the learning outcomes available to students help them to achieve their award. It is about making sure that appropriate and effective teaching, support, assessment and learning opportunities are provided for students.

Quality

The value, worth, or standard of an institution or program in relation to generally accepted standards for an institution or program of its type.

Quality Assurance

Processes and procedures for ensuring that qualifications, assessment and program delivery meet quality standards. The activities that aim at safeguarding quality.

Internal Quality Assurance

Processes of quality assurance carried out within and by or for a higher education institution.

Program objectives: Statements describing the results to be achieved, and the manner in which they will be achieved

Learning outcome: What the student will know or will be able to do as a result of passing the Academic program.

Course outcome: What the student will know or will be able to do as a result of the course delivery.

Teaching strategy: refers to methods used to help students learn the desired course contents and be able to gain skills and to develop achievable goals in the future

Assessment methods: refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students

Benchmarking: It is a way to judge the quality or the performance of other the academic program through comparing its KPIs with best practice programs in other institution

Program specifications: It is a quality document guide that specify the academic program's Vision, Mission, objectives, KPIs...etc. to achieve goal and objectives of the program

Annual Program Report:

This is annual self-evaluation report for the educational institution that is prepare based on the reports of academic programs and the various activities that fulfill the mission of the institution.

Course specifications: It is a quality document guide that specify the academic courses, objectives, CLOs...etc. to achieve the objectives of the program.

Course Report: It is a quality document reporting the student achievement of learning outcomes and the analysis.

Direct Assessment: Assessment based on direct measurement such as marks and rubrics

Indirect Assessment: Assessment based on surveys

3- About the program.

The department awards a Bachelor of Science degree in Mechatronics Engineering after completing (166) credit hours distributed according to the study plan. The student must also finish the summer training for eight weeks for those who have completed (112) credit hours. The student must also do a two-semester research project after completed (132) credit hours.

4- Program Mission and Objectives.

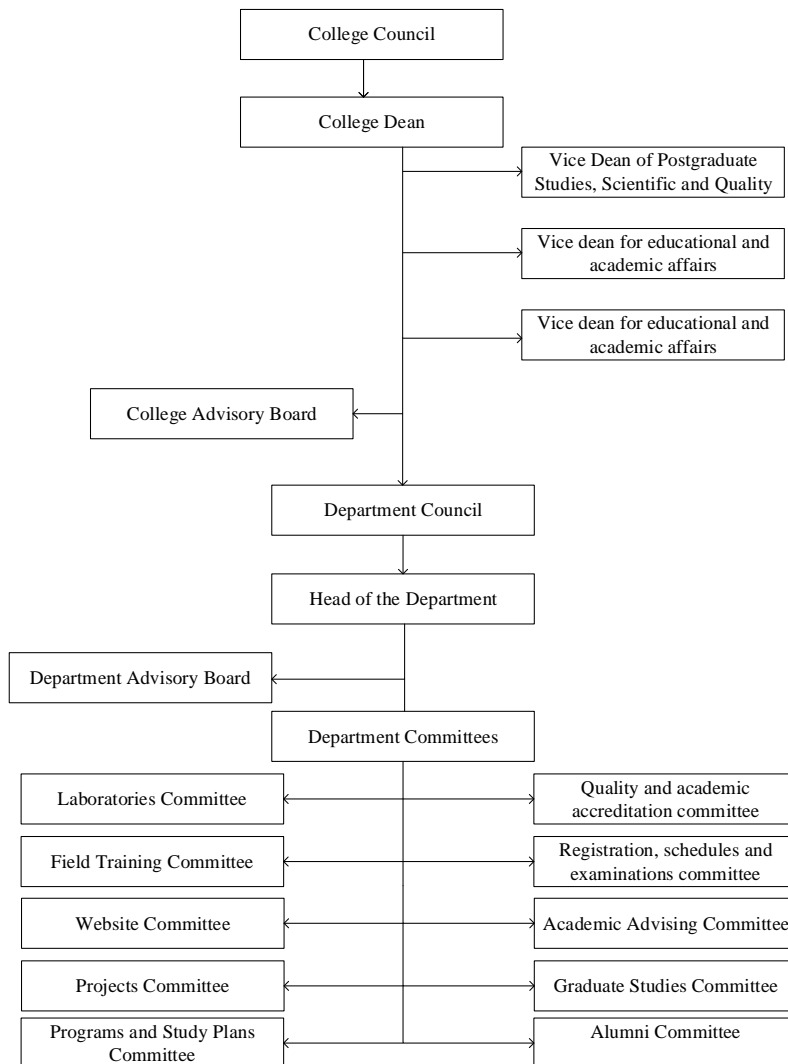
4-1 Mission:

Providing a high-quality educational program in the field of Mechatronics engineering that meets national and international standards, through an academic environment that encourages community partnership in support of the knowledge economy of KSA

4-2 Program Educational Objectives (PEOs):

- Preparing distinguished mechatronics engineers that are able to work in general areas in industry and government.
- Developing students' leadership skills
- Encouraging interest in achieving membership in national and international professional organizations.
- Promoting interest in community service, scientific research and continuous learning.

5- Program Organizational Structure



6- Responsibilities

7-1 Department Council

The department council is formed at the beginning of every academic year. The department Council meets regularly, at the call of the head of department, to study all critical issues of the department, set strategic directions, discuss regulations and operation guidelines, and decide on all academic as well as non-academic issues. According to department procedures, the minutes of meetings and decisions of department have to be endorsed by the department council's approval.

7-2 Head of the department (Head of the Program)

- Chair the department council.
- Hold the responsibility for leading the department.
- Provide collaborative and collegial leadership for the department.
- Supervise the management, development, and evaluation of the curriculum for the program.
- Design and implement the academic plan as it relates to the department and the program.
- Promote professional development activities.
- Form program committees and designate faculty or group of faculty to prepare specific tasks when it's required such as: Conduct students, alumni, and employers surveys, perform academic advising, prepare lectures schedules....

7-3 Quality and academic accreditation committee.

The main tasks of this committee are:

- Promoting and spreading the culture of quality among all employees of the department.
- Collecting and auditing course files for all department programs and uploading them to Google Drive
- Reviewing the descriptions of new and developed courses and programs according to the ABET and NCAA templates.
- Review course and program reports according to ABET and NCAAA templates.
- Follow up on the evaluation of students' outcomes according to the time plan from the date of obtaining accreditation to the date of the visit next scheduled for 2026.
- Collect and analyze all documents related to academic accreditation.
- Preparing annual reports on the progress in achieving the time plan for accreditation and raising the most important challenges facing section.
- Preparing the program's self-evaluation report according to the models of the National Center for Academic Evaluation and Accreditation.

- Preparing the self-study report for the program concerned with accreditation according to the NCAAA or ABE templates.
- Preparing and implementing strategic and operational plans for quality in the program
- Calculating KPIs for programs and preparing annual reports about them
- Fulfilling the qualification requirements for program accreditation issued by the National Center for Academic Accreditation and Evaluation for programs advanced to national accreditation
- Preparing and implementing the operational plan for the department's various programs and preparing an annual report on the extent of progress

7.4 Registration, schedules and examinations committee

The main tasks of this committee are:

- Preparing study schedules in coordination with the college schedules committee: The committee builds the schedules Coursework for male/female students in the Department of Mechanical Engineering, including the distribution of course times in the classroom in an appropriate and balanced manner.
- Organizing and managing the registration process for male/female students in the Engineering Department
- Managing student records and academic archiving related to students In the Department of Mechanical Engineering
- Receives and responds to student inquiries related to schedules study, registration, tests, and providing appropriate assistance and solutions
- Supervising the course registration process, and controlling registration, deletion, and addition procedures.
- Preparing final exam schedules and ensuring their suitability for students.
- Forming monitoring and supervision committees and following up on compliance with those committees

7.5 Academic Advising Committee

The main tasks of this committee are:

- Identifying academic advisors in the department and distributing male and female students to them.
- Informing students of the rules and instructions related to university regulations and clarifying the college's goals
- Submitting quarterly and annual academic advising reports to the college's academic advising committee.

-
- Preparing and following up on guidance forms for each student in the department.
 - Following up on the files of distinguished students, urging them to continue their excellence, and overcoming the obstacles they face their way, and encourage them to continue their excellence, by preparing their own programs.
 - Studying the files of students who are struggling academically or they are expected to stumble, and develop appropriate plans for them
 - Reducing the problem of students' absence from lectures and making every effort to prevent it from becoming a phenomenon

7.6 Graduate Studies Committee

The main tasks of this committee are:

- Review and evaluate applications for admission to graduate programs in accordance with applicable regulations.
- Preparing and updating study plans for the department's graduate programs
- Prepare and review graduate studies regulations and policies in the Department of Mechanical Engineering in accordance with the list of graduate studies at the university and its approval by the Department Council and the College Council.
- Follow up on the completion and evaluation of scientific theses for postgraduate programs
- Organizing scientific seminars and conferences.

7.7 Laboratories Committee

The main tasks of this committee are:

- Work to develop the necessary plans to raise the efficiency of laboratories
- Supervising the provision of security and safety equipment in laboratories and ensuring compliance with laboratory operating and safety standards.
- Preparing electronic and paper publications and guidance bulletins for students, explaining security and safety procedures for prevention of the various risks inside laboratories.
- Submitting and following up on laboratory maintenance requests with the college maintenance official
- Scheduling periodic maintenance appointments for laboratories, and recommending replacement of damaged equipment and materials at the end of each semester study in coordination with laboratory supervisors and technicians

- Follow up on laboratories' needs for equipment and supplies, in coordination with college coordinators, and supervise supply and installation with laboratory supervisors and technicians
- Preparing the committee's annual report at the end of each academic year

7.8 Field Training Committee

The main tasks of this committee are:

- Preparing a list of the names of the department's students who have met the regulatory requirements for practical training and wish to training during the summer of the academic year.
- Exploring and providing distinctive training opportunities for the department's students and distributing them in a fair manner for all in coordination
- With the college's practical training unit.
- Guiding male and female trainees by holding preparation workshops for them before field training and clarifying the regulations and systems related to training and providing them with training models.
- Scheduling the training supervisors' visit to the students during the training period in coordination and communication with the training authorities in coordination with the college dean, preparing the completion and follow-up report.
- Evaluating students enrolled in practical training and monitoring their grades in the system
- Create a database of institutions and companies related to training.
- Studying the legal violations of trainee students, and proposing penalties for them in accordance with the applicable regulations.
- Follow up on the progress of the field training program through continuous communication with male and female supervisors from the department and in field training sites to overcome the difficulties facing program implementation.

7.9 Website Committee

The main tasks of this committee are:

- Developing and editing the department's website
- Follow up on activating the e-learning system and training department employees
- Follow up on the technical equipment of the department's laboratories and halls and provide technical support to the department's employees
- Publish news related to the department on the website and on social media.

7.10 Projects Committee

The main tasks of this committee are:

- Holding lectures and introductory meetings related to student projects
- Receiving project proposals from faculty members and students and presenting them to the Department Council for approval
- Preparing project discussion tables.
- Supervising competitions and exhibitions for projects

7.11 Alumni Committee

The main tasks of this committee are:

- Preparing a database for graduates, institutions, and companies related to graduates.
- Coordination and communication with the college's alumni committee.
- Monitoring the challenges facing department graduates when they join the labor market
- Contributing to the formation of graduates' links with the department, college, and university, and activating communication between them.
- Exchanging academic and professional benefits between the graduate and the department, and developing the skills of students expected to graduate
- Contributing to preparing graduates and those expected to graduate for the labor market, by raising their efficiency and refining their skills during distinguished training programs
- Introducing students expected to graduate to the career opportunities available at institutions and companies in the public and private sectors and the various means available to search for these opportunities.
- Study the problems of graduate students and suggest solutions for them

7.12 Programs and Study Plans Committee

The main tasks of this committee are:

- Preparing, reviewing and developing study plans
- Building new study plans and reviewing their descriptions using the reference framework approved by the university
- Review and develop study plans for existing academic programs and their descriptions based on the reference framework accredited by the university

- Supervising the preparation of course reports at the end of each semester, and studying the extent to which outcomes have been achieved learn the courses, identify the strengths and weaknesses of the courses, and suggest improvements and changes proposed by course professors (if any), and submitted to the Department Council for appropriate recommendation
- Supervising the preparation of the annual report of the academic program, and studying the extent to which the program's learning outcomes are achieved the strengths and weaknesses, suggestions for improvement and proposed changes are submitted to the Department Council for consideration appropriate recommendation.
- Study all proposals submitted to it to improve the quality of study programs in the department
- Reviewing faculty members' proposals for new courses to keep pace with the development of the specialization
- Reviewing proposals for new tracks in the study plan
- Reviewing the content of laboratory courses and their compatibility with the course content
- Reviewing proposals to create new programs in the Department of Mechanical Engineering for bachelor's degrees Master's and Ph.D.

8- Standards adopted by the program

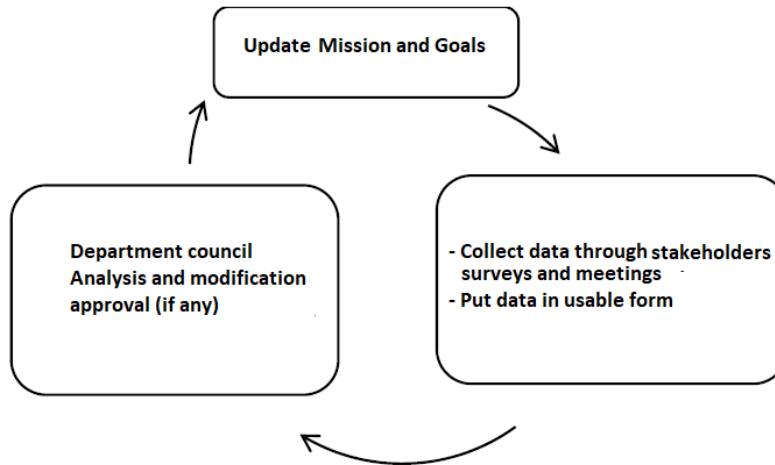
The standards adopted by the program are those developed by the National Center for Academic Accreditation and Evaluation listed below:

- 1- Program management and quality assurance
- 2- Teaching and learning
- 3- Students
- 4- Faculty
- 5- Learning resources, facilities, and equipment

To comply with these standards, the program applies the following procedures:

- **Missions and goals:**
 - The Quality and accreditation Committee (QAC) prepares an initial version of the program mission and goals in accordance with the college and institution missions and surveys stakeholders about them.
 - QAC collects feedback on the proposal from stakeholders and prepares the initial version.
 - Department council discusses the proposed version of mission and goals, makes the changes if any, and approves the last version.

- Department council submit approved version of program mission and PEOs to college council for approval.
- Publish mission and goals.
- Review mission and goals each 3 years according the cycle below



- **Program management and quality assurance:**

For continuous development of the program performance, a quality assurance system is implemented and the following procedures are followed:

- The program is governed by department council acting to provide an organizational climate and supportive academic environment and monitoring the program commitment to apply the institutional regulations and policies in education and research in order to ensure the quality of all aspects
- An advisory committee is formed in order to contribute to the development and performance improvement of the program.
- The performance of teaching staff is evaluated by the department head according a clear mechanism for transparency and accountability.
- The key performance indicators defined by NCAAA are approved by the program to measure the program performance
- The evaluation of program is conducted each year through KPIs analysis, PLOs assessment, surveys and results are used development.

- **Teaching and learning:**

- The Quality and accreditation Committee (QAC) prepares the program specification including graduate attributes aligned with the graduate attributes at the institution and a list of program learning outcomes (PLOs) that are consistent with program mission.
- QAC prepares a document showing that the program learning outcomes are consistent with the requirements of the National Qualifications Framework.
- Obtain PLOs approval from the department council.
- For each course, the instructor prepares a course specification (CS) including course learning outcomes (CLOs) aligned with the program learning outcomes. QAC conducts first review of these CSs before approval of department council.
- For each course, the instructor prepares a course report (CR) at the end of each term to measure and to verify the degree of achievement of targeted PLOs for continuous improvement.
- The program is committed to provide necessary training for the new teaching staff on how to prepare course specification and course report, direct and indirect assessment of CLOs and PLOs.

- **Students:**

Admission of students to the College of Engineering at Prince Sattam bin Abdulaziz University is centrally administered by the Deanship of Admission and Registration. Students are admitted to the Preparatory Year (PY) in Engineering/Science branch. The selection of students for PY is based on their high school GPA and their performance in **Subject Achievement Test** and **General Aptitude Test**. The minimum requirements for admission to the preparatory year are based on the following criteria:

- The total number of accepted students should not exceed the number specified by the university council
- Students are ranked and selected according to their composite average as follows:
 - 30% of General Aptitude Test
 - 30% of Secondary School GPA

➤ 40% of Subject Achievement Test

After completing the PY, students are accepted to the college and distributed to the various departments according to three criteria: their preference, GPA from the PY, and the capacity of each department.

General Aptitude Test is designed, on the pattern of SAT Reasoning Test, to measure critical thinking skills that the student needs for academic success in college. Subject Achievement Test, on the other hand, is a three-hour MCQ exam that covers the basic concepts of Math, Physics, Chemistry, Biology, and English Language at the secondary school level.

Student Admission and Transfer Requirements, and Courses Equivalency are conducted according the Unified Regulations of studies at Prince Sattam bin Abdulaziz University.

● **Faculty members**

- The program follows the university orientation program for new hired academic staff. The process used for orientation of new teaching staff:
- A new hired academic staff will be oriented with his duties, responsibilities, rights, and code of conduct by the deanship of human resources.
- Workshop is planned for the new teaching staff during the first week of every academic year to present them the system and services within college and university campus.
- Workshops are organized to advise them with quality and research system within PSAU.
- Workshops are continuously organized by different deanships in the university for the development of the skills of the new hired academic staff members,
- Research funds from PSAU research deanship are dedicated for the new teaching staff every year.
- Brochures and rules concerning academic advising are available to new teaching staff.
- The program provides the new teaching staff course specification and previous course report that are needed for teaching their assigned courses, in addition to the available materials and other teaching resources.
- Teaching staff are evaluated according to specific and known criteria such as scientific publication, teaching activities, and community partnership activities.

- ***Learning resources, facilities, and equipment***

- The learning resources for each course are specified in the course specifications and validated by the course instructor. Generally, the university offers a variety of learning resources including textbooks, electronic references and web-based resources.
- The academic staff member can follow the pre-specified university process for requesting additional publications or references if needed, that can be submitted to the head of department.
- Relying on the department request, the procurement department can purchase the selected learning materials.