

APJ ABDUL KALAM  
TECHNOLOGICAL  
UNIVERSITY



**APJ ABDUL KALAM TECHNOLOGICAL  
UNIVERSITY**

**ACADEMIC AUDIT MANUAL, 2022**

**CONTENTS**

1.0 INTRODUCTION	3
2.0 OBJECTIVES	3
3.0 STRUCTURE & FUNCTIONING OF THE ACADEMIC AUDITING SYSTEM	4
3.1 IQAC	4
3.2 EXTERNAL AUDITOR	6
3.3 AUDIT PROCEDURE	6
4.0 DOCUMENTS TO BE PRODUCED FOR AUDIT	6
4.1 COLLEGE SPECIFIC DOCUMENTS	6
4.2 DEPARTMENT SPECIFIC DOCUMENTS	7
5.0 ASSESSMENT OF VARIOUS OUTCOMES	9
5.1 CO ATTAINMENT	9
5.2 PO ATTAINMENT	10
6.0 INSTRUCTIONS TO EXTERNAL AUDITORS	11
6.1 COLLEGE SPECIFIC ASSESSMENTS	11
6.2 PROGRAMME SPECIFIC ASSESSMENTS	13
6.3 INTERACTION WITH STUDENTS	16
7.0 CHECKLIST	16
7.1 THE PRINCIPAL	16
7.2 IQAC COORDINATOR	17
7.3 EXTERNAL AUDITOR	17

## 1.0 INTRODUCTION

This document is envisioned to elaborate the process of academic auditing, which can aid the institution/faculty/student for success in the Engineering Education arena. It presents the objectives of academic auditing, the audit procedure, overall discipline and academic functioning of the institution, duties and responsibilities of faculty members, research and consultancy and class/course committees.

There shall be academic auditing in each affiliated college at stipulated intervals. The academic auditing shall be conducted jointly by an Internal Quality Assurance Cell (IQAC) within the college and external academic auditor/auditors appointed by the University. The Internal Quality Assurance Cell in each college shall oversee and monitor all academic activities including assessments. This cell shall prepare academic audit statements for each semester at regular intervals. These reports shall be presented to the external academic auditor/auditors, who shall use it as reference for independent auditing. The external auditors shall submit the final audit report to the University in the prescribed format.

For proper functioning of the academic system in an educational institution and to quantify the efforts dispensed by the faculty and students, some assessment components have been designed. These include the assessment of course delivery as per the curriculum and syllabus of APJ Abdul Kalam Technological University (APJAKTU), the co-curricular and extra-curricular activities of students, overall discipline and the academic functioning of the Institution, delivery of the duties and responsibilities of faculty members, monitoring of the progress of courses, internal assessments, student welfare and grievances.

The process of academic auditing intends to monitor and enhance the quality of technical education through proper guidelines for both teaching faculty and students, so as to ensure qualified engineers/researchers are passing out from Institutions, affiliated to APJAKTU.

## 2.0 OBJECTIVES

- (i) To ensure academic accountability.
- (ii) To monitor and enhance the quality of technical education through proper guidelines for both teaching faculty and students, so as to ensure qualified engineers/researchers are passing out from Institutions, affiliated to APJAKTU.

- (iii) To safeguard functionalities of technical education.
- (iv) To define effectiveness of teaching learning process and to devise methodologies for confirming maximum output from faculty members as well as students.
- (v) To ensure that the colleges are following OBE in its true spirit.

#### **Academic auditing shall cover**

- (i) Course delivery and adherence to the course plan, syllabus coverage, quality of question papers used for internal assessments, internal evaluation, maintenance of laboratory experimental set ups and equipments, practical assignments, mini projects and conduct of practical classes and their evaluation.
- (ii) Co-curricular and Extra-curricular activities available for students, the monitoring mechanism of activity points to be earned by the students.
- (iii) Academic functioning of the college encompassing students, faculty and college administration covering punctuality, attendance, discipline, academic environment, learning ecosystem, academic achievements and benchmarking.
- (iv) The quality criteria prescribed by NBA/NAAC.

### **3.0 STRUCTURE & FUNCTIONING OF THE ACADEMIC AUDITING SYSTEM**

The Academic Auditing system comprises of two bodies; the Internal Quality Assurance Cell (IQAC) at the Institution level and the External Auditors at the University Level. The IQAC will function as a body assisting the External Auditor.

**3.1 IQAC:** Since quality enhancement is a continuous process, the IQAC will become a part of an institution's system and work towards realizing the goals of quality enhancement and sustenance. The motto of the IQAC is to achieve quality through continuous improvement with cooperation of all stake holders. It will channelize and systematize the efforts of the University towards academic excellence.

#### **Functions**

- Taking a lead role in undertaking Academic Audit and to give feedback with the purpose of devising quality enhancement programmes.

- Facilitating the creation of a learner-centric environment conducive for quality education and faculty maturation to adopt the required knowledge and technology for participatory teaching and learning process.
- Arrangement for getting responses from students, parents and other stakeholders on quality related institutional processes.
- Dissemination of information on the various quality parameters of higher education.

### **The composition**

- Chairperson: Head of the Institution
- Teachers to represent all level (Three to eight, the senior among them will be the coordinator/director)
- One member from the Management
- One senior administrative officer
- One nominee each from local society, students and alumni
- One nominee each from Industry and Professional body

The membership of such nominated members shall be for a period of two years. The IQAC should meet at least once in every quarter. The quorum for the meeting shall be two-third of the total number of members. The agenda, minutes and action taken reports are to be documented with official signatures and maintained electronically in a retrievable format.

- It is necessary for the members of the IQAC to shoulder the responsibilities of generating and promoting awareness in the institution and to devote time for working out the procedural details. The institutions need to prepare quarterly the Quality Assurance Report (QAR) for future reference.
- The IQAC may also need to create its exclusive window tab on its institutional website for keeping the records/files of Academic auditing, Accreditation Team Reports, QAR, and Certificate of Accreditation Outcomes and regularly upload/ report on its activities.

**3.2 EXTERNAL AUDITORS:** The external auditors, appointed by the University, will be a proven academician, preferably Professors or Associate Professors from Government /Aided /Govt. Controlled /Self Financing Engineering colleges. The external auditor shall visit their allotted educational institution(s) two times in a year as and when informed by the University. The external auditors shall prepare an online report and upload in the University portal. This report is accessible to the respective Institution and the Principal shall give his/her response on the observations made by the auditors within two weeks.

**3.3 AUDIT PROCEDURE:** The Principal of the college shall ensure that the records/documents listed in section 4.0 are maintained and accessible for both IQAC and external auditors. The IQAC coordinator shall ensure that data are mailed, as the case may be, within the stipulated time to external auditor. IQAC members should conduct internal audit (inter Departmental) of the institution, twice a semester. A group of two members of IQAC, as decided by the coordinator shall verify the details of a department. The external auditors will visit the college, verify the documents and interact with the faculty, staff and students. The auditors shall submit an online report for each program after the audit.

#### **4.0 DOCUMENTS TO BE SUBMITTED FOR AUDIT**

Each affiliated institution shall maintain the following files in soft, hard or in blended form, according to the practice and convenience of the institution. These documents may be made available to the external auditor for the audit.

##### **4.1 COLLEGE SPECIFIC DOCUMENTS**

- Academic calendar with days earmarked with working days, holidays, other activities etc.
- Minutes and action taken reports of student's grievances and appeal committee meetings
- Minutes and action taken reports of discipline and welfare committee meetings
- Teaching and technical staff details with acquaintance roll
- Central library register showing volume and title of books, journals etc.
- IQAC meeting minutes, internal audit reports etc
- Institution Budget
- Details of central computing facility

## 4.2 DEPARTMENT SPECIFIC DOCUMENTS

### A1 – Files (Academic Files)

- Time table (with tutorials) – Staff arranged in hierarchical order
- Internal exam QP (DQAC Approved)
- Innovative Teaching approaches
- Tutorial samples with log book
- SFR (Computation as per NBA, these files for the last 3 years)

### A2 – File (Academic Files)

- Course files (Last 3 years)

### A3 – Files (Academic Files)

- CO-PO, CO-PSO mapping
- PO, PSO attainment
- Curriculum Gap (with Gaps and course identified to address the POs, PSOs)
- Project (a. List of projects with guides and students b. Panels, rubrics and marks of evaluation c. PO, PSO attainment)
- Subject Group (List of groups and Faculty, allotment by HoD, Minutes of each group, Programs/Activities organized under each group)
- Add-on Courses

### B – Files (Staff Files)

(These files shall be updated for the period July- June)

- Research funding (a. Internal, b. External)
- Consultancy
- Collaborative works/research and outcomes
- Journal Publications: SCI, SCIE, SSCI, SCOPUS, Other Journals
- Publications: Conference, Books, Book chapters, Articles, etc.
- IPR (and related activities)
- MoU
- FDP Attended: (a. Outside own college b. Inside own college)
- FDP/Conference Organized
- Awards / Honors
- External Interaction

**C – Files (Student Files)**

- Roll List (for last 3 years)
- KTU Results and Analysis (Semester-wise)
- Success Data of Passed Out Batch
- Placement (Proof- for the previous Academic Year)
- Higher Studies (Proof- for the previous Academic Year)
- Career/Skill Development Programs
- Achievements
- Entrepreneurship / Start ups
- Professional Society Activity

**D – Files (Miscellaneous Files)**

- Staff Extension Activities
- Staff Duties/Responsibilities
- Staff/Guest Appointment Details
- Guest Acquaintance (Semester-wise)
- Department Budget

**In addition to above files, following documents shall also be maintained:**

- Minutes and action taken reports of course/class committees of UG/PG
- Minutes and action taken reports of advisory meetings
- Course Diary for all the courses
- Equipment log registers used in Laboratories
- Log book for summer and contact courses
- Question paper and sample answer scripts for assessment of practical courses
- Details showing the conduct of remedial/minor/honours classes
- Details of faculty evaluation and action taken on it
- Department library register showing volume and title of books, journals etc
- Register showing activity points
- Details of MOOC courses taken by UG/PG students
- Details of computing facility in the computer lab (UG/PG)
- Details of relevant licensed software available in the department



## 5.0 ASSESSMENT OF VARIOUS OUTCOMES

Assessment tools are direct and indirect:

Direct Assessment	Indirect Assessment
Internal Exam	Course End survey
End Semester Exam	Program Exit Survey
Assignment, Tutorial	Alumni Survey
Course Project, Case Study	Employer Survey
Field Visit report	
Seminar	

### 5.1 CO ATTAINMENT

Percentage Weightage for Direct and Indirect Components

Direct	Indirect
80	20

Sample weightage for different direct assessment Tools

Internal Exam	Assignment	Tutorial	Course Project	End Semester Exam	Total
30	20	10	10	30	100

### TARGETS FOR CO ATTAINMENT

#### First time

Internal Evaluation: Average of Internal Marks for the same Course and Program in the previous 3 Academic Years. End Semester Exam: Average of End Semester Exam Marks for the same Course and Program in the previous 3 Academic Years.

**Subsequent Academic Years**

Not less than Previous Year Target, Continuous Improvement Desirable

**Fixing Attainment Levels**

70% or more students Score More than Set Target	3
60% students Score More than Set Target	2
50% or more students Score More than Set Target	1
Less than 50% students Score More than Set Target	0

**Sample CO Attainment Calculation**

TARGET Internal: 62%, Assignment: 75%, End Sem: 58%

Student	% Internal exam marks	% Assignment marks	% Course project marks	% End sem exam marks
1	75	85	80	75
2	60	80	75	68
3	55	73	50	55
4	90	68	68	80
5	80	60	90	45
6	75	90	68	82
7	78	85	75	70
8	48	60	70	56
9	61	80	85	50
10	40	80	60	78
% students above target	50%	60%	82%	60%
Attainment level	1.0	2.0	3.0	2.0

Direct Attainment of CO1=  $1.0 \times 0.3 + 2.0 \times 0.2 + 3 \times 0.2 + 2.0 \times 0.3 = 1.90$

Let the attainment through Course End Survey be 2.8

Overall attainment of CO1=  $1.90 \times 0.8 + 2.8 \times 0.2 = 2.08$

## 5.2 PO ATTAINMENT

Percentage Weightage for Direct and Indirect Components

Direct	Indirect
70	30

A sample mapping of CO-PO for one particular subject is shown below:

CO	Overall Attainment	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
EC10 1.1	2.08	3											
EC10 1.2	2.56	3	3	3									
EC10 1.3	2.4	2						3					
EC10 1.4	2.2	--									3		
EC10 1.5	1.9	3								3			

Direct Attainment of PO1 =  $(2.08+2.56+2.4 \times 0.66+1.9)/4 = 2.031$

Let the Indirect attainment of PO1 be 2.7

PO1 overall attainment =  $2.031 \times 0.7 + 2.7 \times 0.3 = \mathbf{2.232}$

## 6.0 INSTRUCTIONS TO EXTERNAL AUDITORS

To conduct academic audit in an effective manner, the key aspects are categorized into A, B and C. Aspects in A category are very important, requires meticulous checking. Though aspects under B category are also important they are not as important as A category aspects. Aspects under C category are primarily for information purpose. Random checking can be employed for assessing aspects under B and C categories. The auditors can schedule the assessment based on this categorization spending more time in assessing key aspects under A category and less time for aspects under C category. The category of each key aspect is given below within brackets. The general guideline for assessment is also given for each aspect. Wherever numerical values are possible, please give the numerical value in AUDITOR'S REMARKS column in the portal. Kindly give specific remarks against each key aspect (**mandatory**) so that appropriate corrective steps can be taken. Note that your specific remarks are more valuable than the ratings.

## 6.1 COLLEGE SPECIFIC ASSESSMENTS

**Compliance to the Academic Calendar of KTU (A):** Verify various academic activities such as commencement of the semester, dates of internal tests, dates of publishing of marks etc. by cross checking with KTU academic calendar, the college academic calendar and course diary. Excellent grade may be given if the college strictly confirm to the schedule, else rating may be varied accordingly.

**Functioning of students grievances and appeal committee (A):** Verify minutes and action taken reports. Rating may be given according to the details and genuineness.

**Functioning of Academic Discipline & Welfare committee (A):** Verify minutes and action taken reports. Rating may be given according to the details and genuineness.

**Average student to faculty ratio (A):** The average student to faculty ratio index is to be calculated as  $\{20 \times \text{Total number of faculty}\} / \{\text{Total sanctioned strength for all programmes}\}$ . The rating is to be given according to value obtained. Rating is EXCELLENT if the value is 1 or more, GOOD if it is more than 0.9, FAIR if it is between 0.75 & 0.89, POOR if it is between 0.6 & 0.74 and VERY POOR if it is less than 0.6.

Example: If a college has 5 UG programmes (B Tech) and 2 PG programmes (M Tech) with sanctioned strength as follows

UG1 – 60 (2015-16, 2016-17, 2017-18, 2018-19)  
 UG2 – 60 (2015-16, 2016-17, 2017-18), 45(2018-19)  
 UG3 – 60 (2015-16, 2016-17, 2017-18, 2018-19)  
 UG4 – 60 (2015-16, 2016-17, 2017-18, 2018-19)  
 UG5 – 60 (2015-16, 2016-17, 2017-18, 30 (2018-19)  
 PG1 – 24 (2017-18), 18(2018-19)  
 PG2 – 24 (2017-18), 0 (2018-19)

Total sanctioned strength =  $60 \times 4 + 60 \times 3 + 45 \times 1 + 60 \times 4 + 60 \times 4 + 60 \times 3 + 30 \times 1 + 24 + 18 + 24 + 0 = 1221$ . If the college has 47 regular faculty then average student to faculty ratio =  $20 \times 47 / 1221 = 0.77$ . Rating is FAIR. Give the value of student to faculty ratio index in REMARKS COLUMN. Also give the actual strength in this column for information. Sanctioned strength and actual strength are available in KTU website for all the colleges. Number of regular faculty may be verified from the attendance registers.

**Faculty Retention (A):** If the Average student to faculty ratio is maintained at 1 or more throughout the year rating is EXCELLENT, GOOD if it is more than 0.9, FAIR if it is between 0.75 & 0.89, POOR if it is between 0.6 & 0.74 and VERY POOR if it is less than 0.6.

**Faculty Qualification Index (A):**  $FQ = (10 X + 4 Y)/F$  where X is number of regular faculty with Ph.D, Y is number of regular faculty with PG, F is number of regular faculty required to comply 1:20 faculty student ratio. The rating is to be given according to value obtained. Rating is EXCELLENT if the value is 7 or more, GOOD if it is more than 5.5, FAIR if it is more than 5.0, POOR if it is more than 4.5 and VERY POOR if it is less than 4.5.

**Number of qualified technical staff (A):** Verify the technical staff strength from the attendance register, and rate according to the strength and their qualifications.

**Facility of central library with respect to volume and title of books, online & print journals (A):** If the central library has books and journals as per AICTE norms, rating is EXCELLENT. Else, rating may be given accordingly.

**Functioning of IQAC and Progress of IQAC report uploading (A):** It can be judged from the relevant documents kept in the College. If all relevant records are maintained and uploaded (institutional website), EXCELLENT can be given; else grade according to the nature. The required documents are the records/files of Internal Academic Auditing, Accreditation Team Reports, QAR, Certificate of Accreditation Outcomes and its activities including the minutes.

**Institution Budget (A):** The audited budget statements along with supporting vouchers and bills shall be verified thoroughly. The budget shall contain all aspects including salary, infrastructure, maintenance etc. If the statements are well maintained, rating is EXCELLENT. Else, rating may be varied accordingly.

**Details of central computing facility (A):** The Institution shall have a well maintained central computing facility with sufficient number of servers, nodes, major licensed software, net connectivity, printers etc. for the purpose of doing research, thesis and project for all categories of students. The auditors may verify physically and to rate accordingly.

**Principal's response on previous audit reports (A):** The College may be asked to give print out of the last audit report. If the Principal has responded, rating may be given according to the genuineness; VERY POOR may be awarded if the Principal has not responded timely.

## 6.2 PROGRAMME SPECIFIC ASSESSMENTS

**Class/course committee meetings and action taken report (B):** Verify report and minutes of committee meetings. Rating may be given according to the details and genuineness.

**Advisory meetings and action taken report (B):** Verify report and minutes of committee meetings. Rating may be given according to the details and genuineness.

**Syllabus coverage as per course plan (B):** Verify course diary along with course files and check whether the syllabus is covered accordingly. Rating to be done based on syllabus coverage.

**Conduct of Tutorial Classes (B):** A tutorial log book shall be maintained by each department. All details regarding conduct of tutorial classes must be recorded in the log book. Rating may be given based on the mode of conduct and effectiveness of tutorial classes. The deficiency in conduct of tutorial classes may be mentioned under REMARKS column.

**Evaluation of Answer Scripts (A):** Do random verification of question papers and sample answer scripts. Assessment can be done based on (i) quality of question paper (ii) scheme of valuation (iii) assessment and (iv) punctuality.

**Conduct of practical courses (B):** Verify course diary, sample work record, log book of equipment etc. Assessment can be done based on number of students in a batch, time given for doing the experiment, completion of calculations in the lab itself etc. Indicate average number of experiments completed in REMARKS column.

**Evaluation of student's performance in practical classes (A):** Verify the number of experiments and title of experiments with that of syllabus. Verify that work record is evaluated on the same day and viva is conducted on each lab class from the course diary (Lab attendance register).

**Facility to do experiments in the lab (A):** Verify whether all experimental set ups are available as per requirement by verifying the stock register, log register, interaction with students etc.

**Conduct of remedial/minor/honours classes (B):** Each department is supposed to keep a register for recording the details of conduct of remedial/minor/honours classes. Verify this register for assessing this aspect.

**Maintenance of course diary (A):** Course diary is a very important document. All faculty members shall maintain course diaries for all the subjects handled by him/her. All details such as syllabus, course plan, assignments, attendance, internal test marks, extra classes, course materials, ICT/Digital mode of instruction etc shall be entered in the course diary. The rating may be given based on day today update by the faculty in their respective course diary.

**Assessment of Outcomes (A):** Refer section 5. The following details are to be verified for assessment of outcomes:

- Whether internal and assignment question papers mention about COs and knowledge levels?
- Whether the question papers confirm to knowledge levels?
- Whether appropriate tools are used for CO/PO assessment?
- Whether targets are fixed as specified in section 5?
- Whether CO/PO attainment calculation completed?
- Whether there is continuous improvement?

The rating can be given based on the outcome of above parameters.

**Faculty evaluation & remarks of the HoD (A):** Can be assessed based on (i) number of feed backs taken in a semester (ii) % of students participated (iii) corrective actions taken for improving teaching effectiveness (iv) mode and criteria for evaluation etc. Rating may be given after verifying the file containing faculty evaluation and subsequent action taken. Mention the number of faculty evaluations conducted and mode & criteria in REMARKS column.

**Facility in the department library for references (C):** Verify the availability of books and journals in the department library and check the log register. Student's feedback may also be sought. Depending on the facility and usage by the students, rating may be done.

**Conduct of Seminar, Mini project, Project & Thesis (A):** Assess the conduct and evaluation of seminar/mini project for UG/PG according to curriculum/regulation. Verify whether proper references are done prior to selection of topic and sample reports. Rating to be done based on the detailed procedure followed for the conduction including selection, internal reviews, final assessment and the report.

**Faculty with Ph.D for the program (A):** Verify the faculty list and rate as EXCELLENT if one Ph.D faculty is there for each PG program. Else rate it as POOR.

**Computing facility in the department (A):** The department shall have well maintained computer labs as per the AICTE/curriculum requirements with sufficient number of servers, nodes, major licensed software, net connectivity, printers etc. It should also have all relevant licensed software for both UG/PG students for doing their project/thesis work. The auditors may verify physically and to rate accordingly.

**Facility for co-curricular and extracurricular activities (B):** Evaluate this aspect from interaction with students and also by verifying certificates of achievements, photographs/videos etc.

**Students attending MOOC or other online courses (B):** Verify the file showing the details of UG/PG students undergoing/undergone MOOC courses with relevant proof. It can be rated as EXCELLENT if at least 10% of UG students and 50% of PG students are there in the list. The rating can be varied according to the count.

### 6.3 INTERACTION WITH STUDENTS

The following parameters may be assessed after the interaction with students and to be rated accordingly.

**Syllabus coverage (B):**

**Lab Facility and conduct of Labs (B):**

**Co-curricular facility (B):**

**Extra-curricular facility (B):**

**Transferring all intimation from University in time (B):**

**Approach of the management in addressing student grievance (B):**

**Availability of Faculty for all subjects (A):**

**Any other remarks (C):**

**Extra fees/fine imposed on students (B):**

Regarding extra fees/fine, grading need not be given. Only specific remarks be given against the column.



## **7.0 CHECKLIST**

### **7.1 PRINCIPAL**

- Make aware all staff about audit procedure/related documents
- Inform IQAC coordinator and HoDs to prepare documents as mentioned in section 4. The files shown in section 4.2 (A1 files, A2 files, A3 files, B files, C files and D files) are essential files for NBA accreditation. These files will be verified by the external auditor for the odd semester of 2022. These documents will be audited by the University during the external academic audit from the even semester of 2022 onwards.
- Ensure that the internal audits are carried out at specified intervals and initiate corrective measures (wherever required)
- Give response in the corresponding column of external auditors report

### **7.2 IQAC COORDINATOR**

- Carry out internal audit twice in a semester with 2 members of IQAC team
- Maintain the audit report for verification by external auditors
- Ensure that all documents as in section 4 are prepared
- Contact external auditor and arrange for the audit
- Assist the auditor throughout the audit process
- Arrange one member from IQAC (preferably from that department) to assist external auditor for the evaluation of program specific aspects

### **7.3 EXTERNAL AUDITORS**

- Inform the Principal/IQAC coordinator of the College where auditing is assigned
- Carry out audit meticulously as mentioned in sections 5 and 6
- Verify all documents mentioned in section 4
- The files shown in section 4.2 (A1 files, A2 files, A3 files, B files, C files and D files) are essential files for NBA accreditation. Auditors are requested only to verify these files during the odd semester audit of 2022. These documents will be audited during the external academic audit from the even semester of 2022 onwards.
- Prepare the report by giving remarks against all columns
- Upload the report within one week of the audit
- Submit TA/DA/Honorarium bills within two weeks of the audit