



# **QUALITY ASSURANCE**

**- A STATUS REPORT**

**April 2018**

**INTERNAL QUALITY ASSURANCE CELL (IQAC)**

**The National Institute of Engineering, Mysore**



## Index

Sl. No.	Description	Page No.
1.	Preamble	3
2.	The Process of Quality Flow	5
3.	Academic Audit	8
4.	Academic Review Committee	13
5.	Examination Review Committee	15
6.	Class Committee	16
7.	Outcome Based Education Committee	18
8.	Closing Remarks	19



## 1. Preamble

The National Institute of Engineering (NIE), Mysuru, a premier technical institution of the country, was started in the year 1946, on the threshold of India's independence. The Institution was founded by three retired engineers of the erstwhile Mysore state, namely, D.V.Narasimha Rao, S.Ramaswamy and T.Rama Rao. The vision of the founders is well captured in the words of Mr.D.Narasimha Rao, who stated that "The object of the founders was not merely to train qualified engineers with detailed knowledge of changing and up-to-date scientific discoveries, but also to make them useful citizens who would play their part in shaping the destiny of modern India (NIE Archives 1972)". In the last seven decades, NIE has grown from strength to strength and has become synonymous with quality technical education in the State of Karnataka.

Right from the inception, this Institution has imparted value-based technical education. NIE was accorded autonomous status by Visvesvaraya Technological University (VTU) in the year 2007. Indeed, a transparent and good mechanism has been put in place to take care of academic and examination related activities. There is consistency in the delivery of academics that has been highly appreciated by all the stakeholders. Academic autonomy gives freedom to the College to decide about the programme and course content. The faculty at NIE have put together a comprehensive curriculum for all UG and PG programmes. Responsive and vibrant Boards of Studies of engineering disciplines along with a strong Academic Council (AC) and Governing Council (GC) have supported all the creative efforts of faculty of NIE.

The University Grants Commission (UGC) has issued guidelines in the year 2012 for establishment and monitoring of Internal Quality Assurance Cells (IQACs) in higher educational institutions (HEIs). IQAC has to establish an internal mechanism for sustenance, assurance and enhancement of the quality culture of education imparted by HEIs. The major goals are:

1. To develop a quality system for conscious, consistent and catalytic programmed action to improve the academic and administrative performance of the College
2. To promote measures for institutional functioning towards quality enhancement through Internalization of quality culture and institutionalization of best practices.



It is gratifying to note that NIE established IQAC in the year 2010, well before UGC made it mandatory for HEIs. The main functions of IQAC at NIE are as follows:

- To develop and apply quality benchmarks/parameters for various academic activities of the college;
- To facilitate 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;
- To arrange for feedback responses from students, parents and other stakeholders on quality related institutional process;
- To disseminate information about various quality parameters of higher education
- To organize inter and intra institutional workshops, seminars on quality related themes and promotion of quality circles;
- To prepare documents of various programmes/activities of the college, leading to quality improvement.
- To act as a nodal agency of the college for coordinating quality related activities including adoption and dissemination of good practices;
- To develop and maintain institutional database through MIS for the purpose of maintaining/enhancing the institutional quality.

The following faculty members and external experts have been nominated as members of the Internal Quality Assurance Cell (IQAC) of NIE, as per UGC guidelines. The term of the members shall be for two years (till the end of academic year 2019-20).

Members of IQAC, NIE

Sl.No.	Name	Designation
1	Dr.G.Ravi, Principal, NIE	Chairman
2	Mr.G.S.Ramachandra, Hon. Secretary, NIE MC	Management Representative
3	Dr.G.S.Suresh, Dean (AA)	Member
4	Dr.T.N.Shridhar, COE	Member
5	Dr.Suresha B., Dean (R & D)	Member



6	Dr.Bansilal, Professor – Dept. of EEE	Member
7	Dr.H.V.Saikumar, Professor – Dept. of EEE	Member
8	Dr.Kuzhalvai Mozhi, Associate Professor, Dept. of ISE	Member
9	Dr.R.Jagadeesh, Professor, SDMIMD, Mysore	External Member
10	Dr.S.K.Prasad, Professor, Dept. of Civil Engg., SJCE, Mysore	External Member
11	Dr.M.K.Sachidananda, Special Officer, NIE	Special Invitee
12	Mr.M.V.Rajendra, Registrar, NIE	Member
13	Animesh Javali, 7th Sem B.E. (E & C)	Student Member
14	Chaithra. K, 3 <sup>rd</sup> Sem M.Tech (IAR)	Student Member
15	Dr.N.V.Raghavendra, Professor, Dept. of Mechanical Engg. & Head, IQAC	Member Secretary & Coordinator
16	Dr.K.K.Yogesh, Asst. Professor, Dept. of Mechanical Engg.	Co-Coordinator

## 2 The Process of Quality Flow

The quality policy at The National Institute of Engineering (NIE) began to evolve with obtaining Academic Autonomy in December 2007. At the beginning of Autonomous status, a conscious effort was made to keep the curriculum same as that of Visvesvaraya Technological University (VTU) so that there would be a smooth transition. However, some important features such as answer paper seeing (of Semester End Examination SEE), review of answer papers, grievance redressal unique at NIE were put in place in 2007 itself. In 2010, the concept of monitoring and attaining certain bench marks with regard to academic quality slowly started emerging which culminated in the innovative methodology of Academic Audit in 2011. By then committees of UGC, VTU and NBA visited the college and gave very critical inputs. All these committees provided positive feedback about the academic activities of NIE. To critically look into the reports of Visiting Committees and Academic Audit as well as feedback obtained internally, it was decided to link the activities of two committees already constituted, namely Academic Review Committee (ARC) and Examination Review Committee (ERC) with IQAC. ARC has the mandate to review all the academic processes and suggest measures to improve its quality and ERC



looks into the examination related issues and recommend suitable changes. The recommendations of ARC and ERC are critically reviewed by IQAC and after that they are thoroughly discussed at Head of the Departments (HOD's) meeting especially with regard to viability of implementation. Thereafter, suggestions/recommendations are submitted to Boards of Studies (BoS) where eminent academicians and industry experts will deliberate and give their observations. Further, proceedings of BoS and that of ARC, ERC are discussed threadbare at the meeting of Academic council (AC). Upon approval by AC, action plan is formulated for implementation. The flow diagram of Fig.1 provides a graphical representation of process established at NIE for quality related issues.

The tasks which have been already undertaken by IQAC are:

- A comprehensive revision of academic and examination processes based on recommendations of visiting committees of UGC, VTU and NBA is under progress. In this regard, ARC and ERC have come out with specific recommendations.
- A unique concept called '**Class Committee**' has been put in place from the even semester of academic year 2012-13.
- Currently IQAC is dealing with implementation of issues related to recommendations of ARC and ERC.

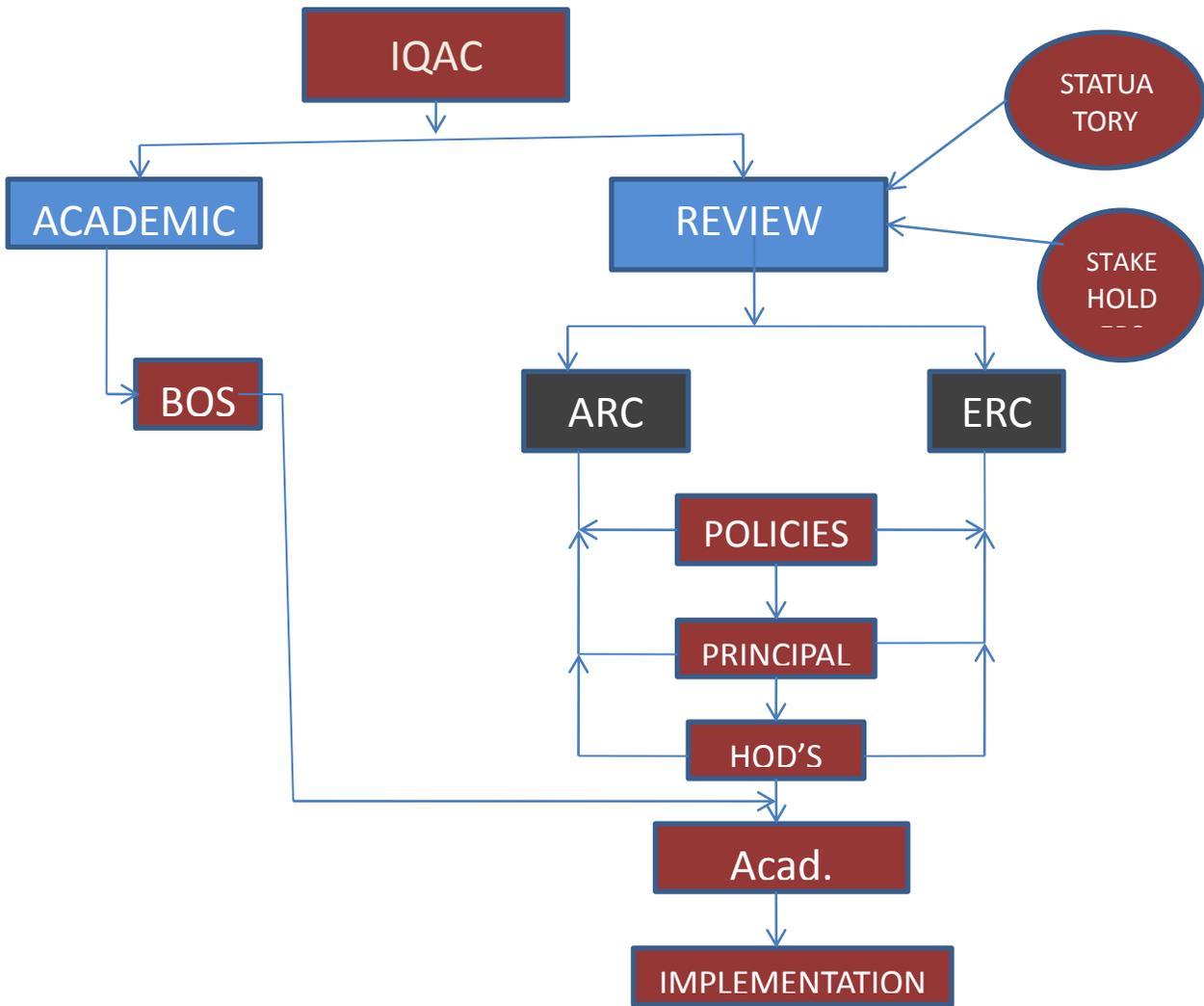


Fig-1 - Flow Diagram



### **3. Academic Audit**

#### **3.1 Introduction**

The National Institute of Engineering NIE, Mysore was accorded autonomous status by Visvesvaraya Technological University, Belagavi, in Dec. 2007. Hence from the academic year 2007-08, NIE has been granted academic autonomy. Various regulatory bodies like Board of Studies (BoS), Board of Examiners (BoE), Academic Council and Governing Council have been constituted which consist of eminent Academicians, Administrators and Highly acclaimed professionals from industry. Taking liberal inputs from these external members of various bodies, a comprehensive Academic Regulations and syllabi for various programmes have been put in place at NIE. The regulations developed at NIE have been quite transparent and have some unique features. The guidelines issued by University Grants Commission(UGC) and Visvesaraya Technological University(VTU) articulates the various facets of academic autonomy and encourages the Institutes autonomous institutes to be innovative in issues of curriculum design, examination processes, academic delivery etc. NIE has realized the importance of continuous improvement in academic activity and hence a novel initiative in the form of academic audit has been evolved. In general, the process of academic audit evaluates the progress made by an Institution towards achieving its goals, identifies the areas of improvement and also progressively monitors the strategies and activities undertaken with respect to academic enhancement initiatives. Hence academic audit would be a vital cog in the process of continuous improvement of quality in Autonomous Institutions. This concept involves a detailed peer review of all the procedures and processes established for Academic delivery.

#### **3.2 Methodology**

In order to review the programme curriculum and regulations, an Audit Committee comprising two distinguished academicians for each programme is constituted. These two experts are designated as Academic Auditors (AA). They are entrusted with the task of reviewing the programme offered by the respective department. The departments which are involved in this process have been grouped into four divisions, namely



- Civil Engineering Division (CED) includes Dept. of Civil Engineering
- Mechanical Engineering Division (MED) includes Dept. of Mechanical Engineering and Industrial & Production Engineering
- Electrical and Electronics Division (EED) includes Dept. of Electrical & Electronics Engineering and Dept. of Electronics & Communication Engineering
- Computer Science and Engineering Division (CSD) includes Dept. of Computer Science & Engineering and Dept. of Information Science & Engineering

The departments are given the mandate to choose the schedule of the process of the academic audit to suit their convenience. This peer review comprise two parts which are:

Part-I

2. Review of syllabi of all the semesters where in the relevance of each course to the programme of study, details of syllabus and its completeness would be examined thoroughly.
3. Review of Semester End Examination (SEE) question papers.
4. Review of academic regulations.
5. Comparison of syllabus of various courses with respect to well established syllabus.

The data about details of Part-I can be captured in Format-A and Form-B, by indicating the observations of Academic Auditors. They will be furnishing the report on:

Format-A

- Curriculum design,
- Weightage of various components of study,
- Mapping of the programme structure with respect to faculty expertise,
- Flow of courses from lower semester to higher semester etc.
- Faculty expertise
- Sequencing Courses
- Weightage of various components in the curriculum

Format-B

- Contents of the syllabus
- Coverage of the course
- List of text/reference books prescribed for the course
- Compares the same with respect to syllabus of their own Institute



- Question Paper of Semester End Examination (SEE)
- Pattern of question papers
- Quality of questions
- Compare the same with Question papers of their Institute

The departments will provide the following information to the Academic Auditors

1. Faculty profile.
2. Programme structure.
3. Detailed syllabus
4. Semester End Examination Question paper of each course.

#### Part-II

In this part, the team of Academic Auditors would visit NIE for a day and

1. Randomly review lesson plan for syllabus actually covered.
2. Randomly review the test and MSE question papers and the answer books.
3. Visit the laboratories and other facilities.
4. Interact with all stakeholders like (a) faculty (b) students (c) non teaching staff in separate groups.

During this day long visit the Academic Auditors would also visit

- Laboratories,
- Checking of the records such as lesson plan, question papers for Continuous Internal Evaluation (CIE),
- Interactions with students, faculty and also technical staff of the department.

At the end of this visit, the Academic Auditors would also interact with

- The Principal
- Dean (Academic Affairs)
- Controller of Examinations
- Head (IQAC)
- Dean (Administration & Development)

The Academic Auditors also would submit a report as per the Format-C. They also would have an exit meeting with Heads of the departments and the faculty members of the departments.



The template of the formats as well as the Guidelines issued to the Academic Auditors are provided in the Annexure-A1.

At the college level, the recommendations of Academic Audit which is done program wise would be consolidated by a Core Committee. This core committee would consist of the Principal, Dean(AA), Head(IQAC), Dean(AD). The recommendations of the Academic Audit can be categorized into

- a. Institute Specific recommendations.
- b. Department Specific recommendations.
- c. Programme Specific recommendations.

Based on the reports filed by AA, the Core Committee(CC) would devise suitable methods to implement the recommendations. The report of the CC and subsequent Action plan would be presented to the Academic Council (AC) and then to the Governing Council (GC) of the college for further action.

### 3.3 Details of Academic Audit undertaken at NIE

The practice of academic audit was implemented for the first time in November 2011. It was decided to invite one distinguished Academician from NITK, Surathkal as one member of AA The other member of AA was invited from a reputed Engineering College which has similar status as NIE. The Academic Auditors undertook the task in a meticulous way and their reports have provided valuable inputs for further improvements in all matters related to academic activity. These reports were consolidated by the Core Committee and most of the recommendations were implemented. Table 1 gives the consolidated outputs of Academic Audit 2011.

**Table 1: Consolidated Output of Academic Audit 2011**

Sl. No.	Recommendations of Academic Auditors	Status of action
1.	To go in for a comprehensive LTP Module to merge practicals with theory component wherever applicable	Implemented with effect from academic year 2011-12



2.	To increase electives – Offer more inter- departmental and open electives.	Implemented from the academic year 2011-12 to limited extent
3.	Go for relative grading	Under consideration
4.	More emphasis on project work	Implemented
5.	Bring in concept of stacked project	Implemented in the UG programmes of CE and ECE
6.	To increase HSS components	Implemented from Academic Year 2015-16
7.	Formulate class committees	Implemented with effect from Academic Year 2012-13
8.	Space out CIE Components	Implemented in 2016-17

Table 2 gives the consolidated outputs of Academic Audit 2017-18 (phase 1).

**Table 2: Consolidated Output of Academic Audit 2017-18 (Phase 1)**

Sl. No.	Recommendations of Academic Auditors
1.	A teaching-learning centre should be established to improve teaching skills of faculty (IITM has such a centralised facility). Retired faculty can be used as trainers
2.	There is a requirement of IT courses through open electives such as Data Structures, RTOS, Verilog, SCADA, OOPs, FPGA etc., to improve the placement of students belonging to core branches of engineering.
3.	Include Mini-Projects right from the second year onwards in line with Stack Projects as in ECE department
4.	The curriculum is satisfactory but the required industry linkage and R&D orientation are missing. It is suggested that you should make good use of your academic freedom to make it more innovative and flexible.
5.	Centre of excellence in areas like Smart Grid, Renewable energy can be initiated in association with industry



6.	Permit fast learners to register for more credits in earlier semester, so that they could take up long term (say 6 months) internship in the final year in reputed companies
7.	Utilise more number of industry experts to teach courses
8.	Separate course on Engineering Economics is needed for all UG programmes. Entrepreneur skills component need to be addressed more effectively.
9.	Publications in paid journals should be discouraged.
10.	Placement in core companies not satisfactory
11.	Target NIFR ranking within 100
12.	Institute level governance is good and transparent
13.	Aim for university status for NIE group of Institutions

The second phase of academic audit 2017-18 is being taken up during April, 2018. The second phase will focus primarily on academic administration. Services of experts from leading autonomous institutions will be utilized to audit academic regulations, examination regulations, governance, etc. After the completion of phase 2, the IQAC will meet and discuss all the recommendations made by auditors, in both phase 1 and phase 2. IQAC will prepare a road map for implementation.

#### **4. Academic Review Committee (ARC)**

Academic Review Committee (ARC) was constituted at NIE in July 2012. The committee is chaired by the Dean (Academic Affairs) and has the Controller of Examinations, Dean (R & D), Head-IQAC and three other senior faculty members as members. This committee has been given the mandate to look into the recommendations of the visiting agencies such as VTU, NBA, UGC, the reports of academic audit and also the feedback given by faculty and students. Based on these inputs, ARC would evolve a set of guidelines which will improve the academic standards. The ARC meets 3-4 times in an academic year. Table 3 gives a sample of recommendations made by ARC over the years.



**Table 3: Major Recommendations of ARC in the Last Five Years**

Sl. No	Recommendations	Status and time line
1	Introduction of principles of Engineering Design as a core course in First year UG Program.	Implemented from Academic Year 2013-14
2	Introduction of integrated (theory + laboratory) courses in certain programmes.	Implemented from Academic Year 2011-12 in some programmes
3	Introduction of Open Electives	Implemented –Elective on Nano Technology, Electives of CS and IS
4	Concept of Stacked Project	Implemented in CE and ECE
5	Question Paper pattern- All Questions compulsory	Implemented from Academic Year 2014-15
6	Follow Bloom's taxonomy in the design of courses as well as question papers	Implemented from Academic Year 2014-15
7	Shifting of courses CIPE and Env.Studies to 2 <sup>nd</sup> year	Implemented from Academic Year 2013-14
8	Go for relative grading	Work in progress, draft version likely to be ready by August 2017
9	Industry internship to be made mandatory	Implemented w.e.f academic year 2017-18
10	Encourage fast learners to enable them to take up 6 months internship in a leading company	To be implemented w.e.f academic year 2018-19

Further, some of the recommendations of ARC have been brought up to the implementation level. They are as follows:

1. Provision to provide Accelerated Term for final year students
2. Provision of Electives in emerging areas
3. Provision to introduce mini project/ design problems/ stacked projects at the UG level
4. To give a fillip to interdisciplinary projects at all levels.



## 5. Examination Review Committee (ERC)

Examination Review Committee (ERC) was constituted in July 2012 along with .ARC. This committee has been given the mandate to look into the recommendations of the visiting agencies, the reports of academic audit and also the feedback given by faculty and students. Based on these inputs, ERC would evolve a set of guidelines which will improve the processes related to examination related issues such as paper setting, scrutiny of papers, evaluation, review system etc. This Committee also would propose a revamping of components of Continuous Internal Evaluation (CIE) and Semester End Examination (SEE). This committee, in a series of meetings has deliberated on various issues and some of the recommendations are shown in Table 4.

**Table 4: Major Recommendations of ERC in the Last Five Years**

Sl. No.	Recommendations	Status and time line
1	To adopt a method of randomized closed review system.	Implemented from Academic Year 2013-14
2	To go in for a comprehensive revision of Question Paper pattern	Implemented from Academic Year 2014-15 for SEE.
3	To enforce Bloom's taxonomy approach in the design of test and examination question papers	Implemented from Academic Year 2014-15
3	To devise a comprehensive revision of evaluation components and the mechanism conducting the events	Revised in the Academic year 2015-16
4	Go for relative grading	Work in progress, draft version likely to be ready by August 2017
5	To implement on-line tests for selected courses	Implemented since the year 2016-17



## 6. Class Committee (CC)

### 6.1 Preamble

The basic objective of this committee is to provide a mechanism for students to express their views about the issues related to academic delivery during the conduct of the classes. This will also enable the faculty to undertake remedial measures, if need be, during the same semester.

### 6.2 Constitution

- a) HoD of the department ----- Chairman
- b) Two senior faculties from other departments of the college nominated by the Dean (AA) - ----- members. One of them to serve a member secretary.
- c) Eight students of the class as nominated by HoD ----- members.
- d) One junior faculty member will be appointed by the respective HOD as faculty Coordinator for class committees. The faculty coordinator will take care of all the logistics involved in enabling feedback through the Software Development Centre (SDSC), scheduling of CC meetings, etc.
- e) The term of nominated members and member secretary shall be one academic year.

### 6.3 Functions

- i. The basic responsibilities of the class committee are to review periodically the progress of the classes, to discuss problems concerning the curriculum and syllabi and also the conduct of the class.
- ii. The class committee shall meet twice in a semester as detailed below.
- iii. The first meeting shall be immediately after the first round of tests. Prior to this meeting, the class committee members will hold discussion with the entire class and list out the grievances and problems. Subsequently, each class member will provide on-line feedback through a customized portal created for the purpose. This feedback will serve as the basis for initiating the discussion in the class committee meeting.
- iv. The Chairman of CC will elicit feedback from students during the class committee meeting, assisted by two external faculty members. The member secretary will note down



the minutes of the meeting, which will be the basis for preparing the class committee report jointly by the three faculty members.

- v. The class committee report shall be submitted to the Head, IQAC within a week after the CC meeting.
- vi. The second meeting shall be conducted within a week after the completion of second round of tests
- vii. A Committee comprising Head( IQAC), Dean(AA) and Dean(AD) will deliberate on the proceedings of the Class Committee and recommendations will be made to The principal for further action.

#### **6.4 Guidelines for nominating members for Class Committee**

The HoD shall use the following guidelines for nominating the student members for class committee.

- i. The topper in the class will be a member irrespective of the gender.
- ii. The CC should have representation from all sectors such as girl students, SC/ST/OBC students etc.
- iii. Amongst the girl students, the number of members can be as follows:

< 20	- 2 members
20 – 40	- 3 members
> 40	- 4 members
- iv. The HOD should take care to select members so as to have representation across all bands of Academic performance. The bands of Academic performance are on the basis of CGPA. These are CGPA (5-6.5), (6.5-8), (8-9), (9-10)
  - a) After identifying the members of Class Committee, the HoD of the Department will make an announcement about their membership.
  - b) The Class Representative (CR) who will be a member of Class Committee is then directed to divide his / her class into 8 subgroups. For each of these subgroups, one member of Class Committee as notified by HoD will be the leader.



- c) Before the meeting of Class Committee is held, each leader will seek the opinion of each of the members of that subgroup and reflect the collective opinion of the subgroup while filling up the questionnaire.

The above detailed procedure will ensure that opinion of all the students have been taken and will also allay the fears of members of Class Committee about victimization.

### **6.5 The guidelines for conducting the meetings of the CC**

- Soft copy of the questionnaire has to be filled by individual Class Committee member in isolation. He/she should be directed to take hardcopy of the same and then delete the file he/she just created.
- Hand over the hard copy to the HoD individually at least 2 hours prior to the starting of meeting.
- Identity of the student is not revealed anywhere in this format.
- HoD who is also the Chairman of the Class Committee would in consultation with other faculty members of the Class Committee would read each filled up format and seek the opinion of the student members.
- On the basis of the opinions expressed, the proceedings of the meeting shall be drafted.
- The proceedings of the meeting of the CC along with recommendations of the HoD shall then be transmitted to The Principal,

## **7. Outcome Based Education Committee (OBEC)**

NIE adopted outcome based education with effect from academic year 2013-14. OBE focuses on student learning by:

- Using learning outcome statements to make explicit what the student is expected to be able to know, understand or do;
- Providing learning activities which will help the student to reach these outcomes;
- Assessing the extent to which the student meets these outcomes through the use of explicit assessment criteria.
- Designing a continuous improvement cycle, by using the assessment reports



Even though, designing, implementing and evaluating OBE falls within the purview of IQAC, an exclusive committee, named, Outcome Based education Committee (OBEC) has been constituted comprising faculty members with rich experience in designing and assessing OBE documents and processes. The Head, IQAC is the member secretary of OBEC, which meets at regular intervals and takes stock of OBE related issues in the college.

## 8. Closing Remarks

Maintaining the momentum of quality consciousness is crucial for technical institutions. Internal Quality Assurance Cell is conceived as a mechanism to build and ensure quality culture at the institutional level. Internal Quality Assurance Cell (IQAC) also ensures post accreditation quality sustenance activity. The IQAC at NIE will strive to be a driving force for ushering in quality by working out intervention strategies to remove deficiencies and enhance quality.

\*\*\*\*\*

Contact Person:

Dr.N.V.Raghavendra

Professor, Dept. of Mechanical Engineering &

Head – IQAC, NIE, Mysore

E-mail: [nvr@nie.ac.in](mailto:nvr@nie.ac.in)

Ph: 91-98455 24956