

**PROCESS FOR DEFINING THE COURSE OUTCOMES, FORMING OF COURSE  
ARTICULATION MATRIX AND PROGRAM ARTICULATION MATRIX**

The process adopted for defining the Course Outcomes, forming of Course articulation matrix and Program articulation matrix in the department is as given below:

1. Head of the Department will assign Course Coordinator for every theory, laboratory and project courses based on following criterions:
2. Faculty teaching the theory course or conducting the laboratory work,
3. Faculty with specialization in the respective course,
4. Project coordinator for project related courses.
5. Every course coordinator will frame the course outcomes considering the **guidelines** decided by PAQIC as given in **Part-I**.
6. After framing the COs of the Course, course coordinator will establish the mapping between the COs and POs (Course articulation matrix ) using the **guidelines** given in **Part-II**.
7. Based on the Course articulation matrix, Course coordinator will establish the mapping between the Course and the PO & PSOs using the guidelines given in **Part-III**.
8. Course outcomes, mapping of COs with POs/PSOs and the mapping of course with POs/PSO for all the courses will be finalized only after the discussion and approval by Program Assessment and Quality Improvement committee(PAQIC) and subsequently by the Board of Studies(BoS).
9. Any revision in COs will have to follow the step 1 to 5.
10. Member Secretary/Coordinator PAQIC will prepare the Program Articulation Matrix considering all the course in the curriculum. It will also be ensured that enough courses are contributing to every PO/PSO.
11. In case, any of the PO/PSO has insufficient no of contributing courses, following corrective actions may be taken:
  - Improvement in curriculum contents to obtain better mapping of CO articulation and PO articulation matrix
  - Addition of new courses
  - Use of additional indirect tools for PO/PSO assessment.

## Part-I

### **Guidelines for Framing the Course Outcomes**

- Course outcomes should be the statements defining what the student is expected to know and will be able to do upon completion of the course.
- There should be four to six course outcomes for each theory course depending upon the credits allotted.
- Every course outcome should be addressed by a related content in the syllabus.
- Every course outcome should be measurable.
- Course outcome should start with action verb.
- While framing the course outcomes, the learning levels as per Bloom's Taxonomy should be taken into consideration.

## Part-II

### **Guidelines for Establishing the Correlation between COs, POs and PSOs (Course Articulation Matrices)**

The mapping between COs and POs & PSOs should be based on following considerations:

- **Essence:** Understanding the essence of each Program Outcome and Program Specific Outcome by referring to various key words in the PO/PSO statements and correlating them with CO statements.
- **Hours per Week:** The number of teaching/ interaction hours required to cover that part of syllabus which addresses the particular CO.
- **Learning level:** Learning level of Bloom's Taxonomy which can be used to assess the attainment of CO.
  - Accordingly, the mapping should be done using following three correlation levels.
    - High correlation = 03
    - Moderate correlation = 02
    - Low correlation = 01

## Part-III

### **Establishing the correlation between Courses, POs and PSOs (Program Articulation Matrices)**

Program Articulation Matrix should give an overall idea about the extent of contribution of curriculum for the attainment of program outcomes and program specific outcomes. The mapping between courses and POs & PSOs is based on the contribution of all individual course outcomes of a course to the POs and PSOs.

Based on this, following criteria has been finalised to map the correlation level between POs & PSOs and individual courses having more than four course outcomes.

- **High Correlation (Level = 03):** If minimum two number of COs of a course contribute substantially to a PO (or PSO) than that course is said to have a Strong correlation with that PO/PSO.
- **Moderate Correlation (Level = 02):** If at least one CO contributes strongly or/and minimum two COs contribute moderately to a PO than that course is said to have a Moderate correlation with that PO/PSO.
- **Low Correlation (Level = 01):** If none of the above two requirements are satisfied but some COs still map with PO (or PSO) than that course is said to have a Low correlation with that PO/PSO.
- **No correlation (Level = 0):** If none of the COs of a course contribute to the PO or PSO than that course has Null correlation with that PO/PSO.
- For courses having four or less number of course outcomes, the highest correlation is considered.



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**POLICY FOR SETTING OF CO, PO AND PSO ATTAINMENT TARGETS**

The courses in the curriculum are of different difficulty level, nature (i.e. theoretical /analytical/design/application oriented etc.) and credits. New courses are introduced in the curriculum as a part of regular improvement. Also, with the minor revision in curriculum and course outcomes, the corresponding articulation matrices get changed. This process affects the CO and PO attainment levels. Following policy will be in place for setting of CO, PO and PSO Attainment Target Level.

**Setting of CO Targets**

1. CO attainment targets will be decided in terms of expected number of students in percentage getting equal or more than the satisfaction level marks for each tool which addresses the related CO.
2. The courses with theoretical concepts will have higher set targets as compared to analytical courses.
3. For new courses or for the revised curriculum structure, initial target will be set at 60%.
4. The revision in CO attainment target will be based on the history of actual attainment over previous 2-3 years.
5. Wherever the actual attainment is continuously rising in previous years, the corresponding target of that CO may be increased for the next year to facilitate continuous improvement.
6. Wherever the actual attainment is less than the target level, corrective actions should be taken at course coordinator level in terms of additional pedagogical inputs for the further part of the syllabus and forthcoming batches.
7. The individual course coordinator will analyse the attainment results of each CO and accordingly propose the revised targets if required in meeting of PAQIC where they will be discussed and approved with necessary changes if required.

**Setting of PO and PSO Targets**

1. With the revision in curriculum, the initial target is considered as 75% for each PO and PSO.
2. After the VIII semester examination, the attainments of POs and PSOs will be calculated for the graduating batch by direct and indirect tools.
3. If the PO attainment meets the target level consistently for three batches then, the PO target may be increased to the next level for continuous improvement.
4. In case the PO/PSO targets are not met, actions like identification of weakly satisfying courses, improvement in curriculum, changes in content delivery, etc will be incorporated.



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**PROCESS TO IDENTIFY THE COURSES WEAKLY CONTRIBUTING TO PO AND  
PSO ATTAINMENT**

Following documents are referred for identifying the courses which are not contributing satisfactorily towards the attainment of Program Outcomes:

- i) Course outcome attainment results of individual courses
- ii) Program Articulation matrix, which gives the relationship between the POs and various courses.

The process to identify the courses weakly contributing to PO attainment is explained below.

- Step 1.** Every Course coordinator calculates the attainment of course outcomes of theory and laboratory courses after every examination.
- Step 2.** The results of CO attainment and cumulative attainment of POs and PSOs for a particular batch are presented and discussed in the PAQIC meeting.
- Step 3.** In case the CO attainment of any course is less than the target level, the course coordinator is advised to identify the reasons for not attaining the target and take corrective actions.
- Step 4.** Similarly in case, the attainment for any particular PO is not satisfactory, the courses having lower contribution are identified and corrective action for improvement is suggested.
- Step 5.** The various measures such as curriculum update, changes in content delivery methods, additional coaching, difficulty solving sessions etc. are incorporated.
- Step 6.** After the VIII semester examination, the attainments of POs and PSOs are calculated for the graduating batch by direct (program articulation matrix) and indirect tools. (i.e. placement statistics, programme exit survey and students appearing for competitive exams etc.)
- Step 7.** If the PO meets the attainable target level consistently for three batches then, the PO target is increased to the next level for continuous improvement.
- Step 8.** The targets for the POs and PSOs are decided in a PAQIC meeting.



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**POLICY FOR TEACHING-LEARNING WORKLOAD ALLOCATION**

1. The direct teaching-learning workload allocation to faculty members shall be in accordance with the “UGC Regulations on Minimum Qualification for appointment of Teachers and Other Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education 2018,” Clause No. 15.
  - Assistant Professor - 16 hours per week
  - Associate Professor/Professor - 14 hours per weekProfessors/ Associate Professors/ Assistant Professors involved in administration/ extension work can devote two hours per week from the teaching and learning hours.
2. The allocation of course to a faculty member shall be based on the following:
  - Area of specialization / expertise
  - Experience (teaching/ industrial)
  - Training/workshops/online courses attended/completed
  - Faculty’s choice/ Department’s need
  - Students’ feedback
3. The elementary theory courses to be taught at UG First Year level will be preferably allotted to experienced faculty members.
4. A faculty member will preferably teach an allotted course to at least three batch of students.
5. Every faculty member will be encouraged to opt for a new course, in case he is teaching the course for more than four or five years subject to the availability of alternate faculty for the course.
6. Faculty members will be encouraged to propose, design and teach the courses in emerging areas.
7. Laboratory courses will be normally allocated to the faculty member who is teaching the theory course.
8. Not more than three theory courses will be allocated to any faculty member in one semester.
9. To decide whether an elective course may be floated or not, the choice of students will be given priority.
10. The load allocation will be done in transparent manner in the department meeting or by one-to-one consultation with faculty members.



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**POLICY FOR IDENTIFICATION OF SLOW AND FAST LEARNERS**

**Identification the Academically Weak Students**

1. The identification of weak students is done at the beginning of every odd semester and after the conduction of Test1 in each semester.
2. The cumulative grade points (CGPA) is taken as basis for identification of weak students at the beginning of odd semester. Students with less than 6 CGPA are considered as weak.
3. Performance of these students is specially monitored through Mentor-Mentee scheme.
4. For identifying weak student in a particular course, the marks secured by the student in Test 1 is considered as basis.
5. Students securing less than 40% marks in Test 1 examination will be considered as weak and to improve the performance in the course, remedial classes, personal counselling and difficulty solving sessions will be conducted. If required, discussion with parents can be held.

**Identification of Fast Learners**

1. The identification of fast learners is done at the beginning of every odd semester.
2. The cumulative grade points (CGPA) of student is taken as basic for identification of fast learners at the beginning of odd semester. Students with more than 8.5 CGPA are considered as fast learners.
3. Such students are encouraged to opt for Minor/Honors, register for credit transfer through MOOC courses, participate in various competitions and do the research internship at VIII semester.
4. At course level, such students can be assigned higher level work like, assignment with higher level of cognitive learning, preparation and presentation on some topic in the class in front of students using PPT or black board, mini-project making, interdisciplinary project with students of other departments etc.



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