

BEST PRACTICES

BEST PRACTICE – 1: Industry-Institute Relation towards Skill Development

Objectives

- To impart the Engineering skill from the industries
- To bridge the gap between the industry and academia
- To make the students job ready by the end of the program
- To groom the students to become Entrepreneur

The Context

There is a need to create avenues for a close academia and industry interaction through all the phases of technology development, starting from conceptualizing to commercialization. Students need to be skilled to work on innovative ideas. The industrial linkages will help the Institution and hence the students

It should continue for longer period for preparing the man power of world class in the field of technology by inculcating various skills required thereby contributing to the economic and social development

To help to design and deliver training modules for students that they are made industry-ready.

To help the faculty to understand expectation of industry so that they can align their teaching to the needs of the industry.

To facilitate internships/in-plant training/industrial project for students to ensure that they get industry exposure during their campus days, which leads to better employability

To groom them an entrepreneur by inviting achievers of the industries

The various types of interactions between academic institute and industry addressed regularly. It is evident that collaboration of industry and institution in skill development leads to innovations. This practice creates healthy environment in the country by which there will be an all-round development. Institution has an explicit division for industrial linkage which houses placement division under the headship of a director. They play a pivoting role to link the industries with departments based on the requirement.

The best practices of our Institute to enhance the interaction between Industries and Institute are:

- Industrial visits/tours
- Industrial training/internships

- Industrial projects
- Patenting
- Industrial consultancy
- Product development through collaboration participation in the industrial expo
- Inviting industrialist as guest speaker/expert
- Arranging the hands on training in the cutting edge
- Technology Entrepreneur development through industrial collaboration
- Online courses for filling the industrial gaps
- Value added courses

Students are visiting the industries as a normal procedure and encouraged to undergo industrial training and internship during their winter and summer holidays. Industrial linkage division is arranging the industries to the students to undergo training. Students are encouraged to take up industrial project which help them to understand the industrial requirement. IPR cell is conducting seminars and encouraging the students/ faculty members to register for patent if their project has novelty. Few faculty members are taken the industrial relation to the next level by taking the consultancy work from the industries. Students are involved in the development which gives more hands on industrial project. Guest lectures are organized by each department to fill the gap between the academia and the technology expected from the industries. This will enable the students to study content beyond the syllabus to make them self industry-ready. Each department conduct value added course and certificate course for the benefits of students. This will help the students to update their knowledge in cutting edge technology. Online course linked with industrial need are announced by the department so that students can have the international certification. Department invites industrial expert for the expert lecture, functions and activities. Students could interact with the industrialist and discuss their doubts directly. Students could able understand the corporate ethics and expectation from them.

Science Expo

The college conducts Science & Tech Expo every year in the month of October to kindle young minds. It explores the innovative and creative thoughts of the young minds, finding the right persons to implement the innovative project ideas. It guides the students to explore their knowledge for real time practical training by providing laboratories with advanced equipments to motivate the students to participate actively. It also provides the opportunity for students,

teachers and other people to improve their understanding of science and share their research projects and investigations. Indeed, a science fair is a good form of knowledge-building and social development.

Evidence of Success

- On organizing the industry explorer program, students are exposed to industrial expectations to focus on the real time skill set
- Performance is improved by 30% in placement
- Increase in participation of students in attending internship
- Industry understands the need of institution and has come forward to offer in plant training
- Industrial visits/Projects with our continuous efforts
- More industry participation of industries in Industry explorer program
- More online course registration by faculty and students
- More number of funds received from different agencies
- Students are encouraged to take up industrial projects
- Innovative projects and identified and applied for IPR
- Enhancement of problem-solving skill to face the challenges associated with carrying out investigation
- Participation in design contests by student

Outcomes:

- CSIR programs were arranged in the campus on technology and skill development
- Two DST, EDII sponsored Entrepreneurship Awareness camps (EAC) were arranged on the motivation towards entrepreneurial thoughts
- DST sponsored 3 days EAC has been arranged through CED, Madurai
- Students attended program in FTI, Bangalore
- Online learning and examinations were arranged through amazon web services, sales Forge, Yuvi Geek networks Pvt., Ltd., Red Hat and Oracle
- Webinars through IIT Remote centre
- Programs by ICT Academy

Problems Encountered and resources required

- Students' communication is a biggest threat due to their family background
- Interface with leading industries is a mighty task
- Getting Industrial training/ project in software industries is a difficult task
- The institution is far away from the Industrial corridor.

BEST PRACTICES-2: Outcome Based Education (OBE) in Teaching-Learning Process

Objectives

- To calculate the PO attainment to understand the success of teaching-learning process To increase the students involvement in the learning process
- To use the teaching pedagogy for effective teaching
- To prepare the students to meet the global demands in technological implementation and innovation through research

The Context

OBE is focused around the students for successful learning outcomes at the end of the program. The outcomes are the abilities to be developed and the performance of the students in terms of learning competence in using the content, information, ideas and tools.

The Practice

OBE is practiced in each department to understand the attainment of each course delivery from the following.

Program Educational Objectives (PEOs)

PEOs are programme specific objectives and realized through various surveys after four to five years of student employment. PEO describes the career and professional accomplishments of an engineering graduate.

Program Outcomes (POs) and Program Specific Outcomes (PSOs)

POs and PSOs are to be aligned with PEOs and graduate attributes. PSOs are specific to each program. Both are related to Knowledge, Skill and Attitude of graduates as they progress through their graduation.

Course Outcomes (COs)

COs are more specific statements to a particular course in the program, which are required to be attained at the end of each course.

CALCULATING CO LEVEL FOR INTERNAL AND EXTERNAL EXAMS

Assessment and Evaluation Methods:

There are two methods for assessment namely, direct and Indirect methods where

The internal exam questions must be mapped to their CO's, this help us to list the marks obtained by students for CO. RUBRICS helps us to define the threshold through which level of attainment of a CO's are calculated. Rubrics exam used in sample calculation is

Rubrics (for threshold value = 50%)

50% of students above 50% 1 (low)

60% of the students above 50% 2 (medium)

70% of the students above 50% 3 (high)

The Threshold value is the Minimum pass percentage for each CO in a subject.

Step 1: Calculating CO level for internal and external exams

The marks obtained by the students for each CO (internals and university) are listed out as shown in the below figure is based on the weightage allocated (max mark CO wise) for the CO's in the exam. Level of CO attainment is based on the percentage of students above the threshold percentage.

For example: In the above table to calculate the level of CO1 for Test 1, the marks scored by 4 students are listed CO-wise and their max mark is specified. Since 50 is the pass percentage threshold and rubrics are set for 50%, by calculating number of students above threshold (only 2 out of 4 which is 50%) the level is defined as 1(low) as specified in the rubrics

Step 2: Calculating Final CO attainment for the subject

Based on the level of CO obtained for internal and external from the above method the final CO attainment is calculated. The level of CO of each test are listed in the below format.

Internal exam and assessments						
C101	IA-1	IA-2	IA-3	Internal	Sum of Internal	University
CO1	1	-	3	3	2.33	3
CO2	3		3	3	3	3
CO3		3	3	3	3	3
CO4		3	3	3	3	3
CO5		3	3	3	3	3
Internal/ University attainments					2.87	3
Weightage					20%	80%
Co-attainment for the subject					0.25	2.40
Final co-attainment for the subject					2.97	

For measure PO in direct method a CO/PO matrix is used to measure PO. The CO are linked to the PO using the CO vs PO matrix as stated in Course Syllabus blueprint. When designing the CO, lecturers of each course map their CO to the appropriate PO to ensure that all PO are delivered throughout the study.

Defining CO weightage for a PO in CO/PO matrix, the weightage scale can be of any format (1-10, 1-100) but by using the scale 1-3 helps us to simplify our calculations

Where 1 represents Low; 2 represents Medium; 3 represents High

Calculating PO attainment for direct method

The PO attainment is calculated by using the predefined CO/PO matrix and the value of Final CO attainment for the subject

The PO attainment is calculated by using the formula

PO attainment = Avg, of CO's of a PO /3 X Final CO attainment for the subject

For Example, if you want to calculate the PO attainment value for PO1 in the below table PO attainment for PO1 = (Avg. of CO's for PO1 / 3) X 2.97

PO attainment for PO1 = 2.97

Calculating CO level for internal and external exams

This method is purely survey oriented, So the calculations are based on data and surveys collected from the following

Current Passing out students

Stakeholders

Alumni

Survey from placement officers,

The questions in the survey sheet should represent the PO's All these survey needs to be a quantified one (1, 2, 3) and they must be based on predefined levels like Rubrics defined for direct calculation. Sample rubrics for indirect calculation.

Rubrics (for threshold value = 50%)	
50% of students above 50%	1 (low)
60% of the students above 50%	2 (medium)
70% of the students above 50%	3 (high)

These levels of attainment are then listed out according to their category in the below format for calculating the indirect PO attainment

Survey Indirect PO Attainment

Survey	Indirect PO Attainment														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Current Passing Student	3	2	1	1	2	3	1	3	1	2	2	2	2	2	1
Alumni	3	2	2	1	2	2	2	1	2	2	3	2	3	3	1
Placement Officers	3	2	3	2	2	2	1	1	3	2	2	3	2	1	1
Indirect Program Attainment	3.00	2.00	2.00	1.33	2.00	2.33	1.33	1.67	2.00	2.00	2.33	2.33	2.33	2.00	1.00

The indirect program attainment is calculated by using the formula

Indirect program attainment = Sum of levels of attainment of a PO / 3

For Example, to calculate indirect program attainment for PO1

PO1 attainment = 3

Calculating Final PO Attainment

Final PO attainment comprises of both Direct method and Indirect method hence the found calculated value (PO attainment) are listed out corresponding to their CO. And summing up them provides the PO attainment based on the weightage allocated

Similarly PO attainment is measure for all subjects and the cumulative PO is calculated. The results from PO calculation are further used for Graduate Attribute (GA) and Program Educational Objectives (PEO) using respective matrices.

Evidence of Success

- The attainment factor is the evidence for successful teaching -learning Process
- Students participation in the learning process has been improved
- Teachers are able to plan their lesson so that the students can understand the delivery
- Teachers are using pedagogical methods in the course delivery

Problems Encountered and resources required

- Communication is the problem for the students belonging to the rural background. Some efforts are always needed to overcome the same. Communication lab, BEC certification, Language development Hour and placement training are some of the avenues which are available in our system to meet out this challenge.
- Outside exposures are limited to the students due to the locality and economic background. Hence many training programmes are arranged inside the campus itself with the internal expertise and outside arrangements at affordable cost.