

Effective course and curriculum design of MLR institute of technology an autonomous institution – A case study

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Abstract: Curriculum design is an important criterion for successful program outcomes since it is a prime work in teaching and learning process. In this concern, the content provided in the curriculum is to be highly effective and updated. This should meet the industry requirements. An autonomous institution implementing a new engineering curriculum should fill the gap identified in the previous curriculums. Autonomous status provided us with adequate flexibility to frame the courses in the programs with some guidelines to reach the expected program outcomes. Our institution, MLR Institute of Technology, is an autonomous institute from 2015.

Keywords: Curriculum, Board of Studies, Curriculum gap, MOOC's, Academic Regulations

1. Introduction

The successful completion of course is determined by the curriculum. In this stage, we, the faculty can define the content that is to be delivered to the students. Our curriculum should identify the needs of present scenario and the gap between the existing scenario and finally what industries need. In past decades, our education system was futile due to the failure of poor curriculum design. For the best curriculum design, we need flexibility from the universities and controlling authorities of educational institutions to frame the syllabus. The curriculums are implemented effectively with the guidelines given by the AICTE.

2. Curriculum design

Our institute is now an autonomous institution from the year 2015.

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In our latest curriculum design, we have included all stock holders like alumni students, parents and experts from industries.

In addition to them, we have also considered our most regular recruiters suggestions in new curriculum design. The proposition of Board of Studies (BOS) members from the reputed industries and institutions is also a valuable input for the new curriculum design. Our ongoing regulations are MLR-15, MLR-16, MLR-17 and MLR-18 for final year, third year, second year and first year respectively.

3. Course description

Course description consists of course overview, prerequisites, syllabus with code and text, reference books, useful website links, MOOC's links, marks distribution, credits and contact hours, course objectives, course outcomes, course plan etc.

Table 1: How Program Outcomes are assessed (a sample)

S. No	Outcome	Level	Proficiency assessed by
A.	An ability to apply knowledge of mathematics, science and engineering fundamentals to the conceptualization of engineering models (Fundamental Engineering Analysis Skills).	H	Assignments, Exercises

N = None S = Supportive H = Highly Related

Table 2: Course plan format (a sample)

Lecture No.	Unit	Learning Outcomes	Topics	Blooms Level	Mode of teaching	Text/Reference Books no	Page no of the Books
1-3	I	To understand the characteristics of p-n junction diode and its temperature effects	The volt ampere characteristics of PN diode, the temperature dependence of V-I characteristics	Understand L2	Board/chalk, PPT, Activity- Flipped classroom	T1,R2	16-30 & 83-89

Table 3: Mapping course outcomes leading to the achievement of program outcomes

Course Outcomes	Program Outcomes											Program specific outcome
	A	B	C	D	E	F	G	H	I	J	K	L
CO1	2	2		1		2				2	2	
CO2	1	2		2		2		2				2
CO3	3	1		2						1		
CO4	1	2		3		1				2	1	
CO5	2	3		3						2	3	

3 = high, 2 = moderate, 1 = low

4. Course file content

The course files are prepared by the concerned faculty for every course. They contain the following items in same order to help the students to acquire more understanding of the subjects. The course file includes course description, lecture plane and syllabus coverage, time table, class notes for all units in prescribed form, application of blooms taxonomy, objective type questions and answers, for the core subjects GATE level objectives and answers, Assignment questions with answers, tutorial questions and answers, Examination objectives, students seminar topics, MOOC's course details, micro projects, Mid examination question paper quality evaluation, remedial classes for the weak students details, target percentage of pass, sample assignment question papers and class test papers.

5. Active learning strategy and observation

In our new teaching and learning process of an autonomous curriculum, an active learning process is a milestone activity. For every unit and every subject at least any one active learning strategy is compulsory. The active learning strategies may be group writing assignments, flipped class rooms, Think pair share, zig jaw, quiz, roll play etc. Practically, this made a very drastic change in student's education platforms. Around sixty active learning activities were conducted in our department in the last semester.

6. Evaluation process

Evaluation process is an important process in education systems. This year we have started to evaluate the papers in online mode. This helps the faculty to evaluate the papers anywhere. External examination papers are evaluated by two examiners i.e. externals and internals. If any deviation of marks more than 15 is found, then those papers will go for third evaluation by external examiners.

Table 4: Examinations tools and evaluation process

S.no	Examination Components	Total Duration	Descriptive Duration	Objective Duration	Maximum Marks			Total Marks
					Descriptive	Objective	Assignments	
I.	I Mid Exam	90 minutes	70 minutes	20 minutes	10	10	5	25
II.	II Mid Exam	90 minutes	70 minutes	20 minutes	10	10	5	25
III.	External Exam	3 hours	3 hours	-	75	-	-	75

7. Results and discussions

The implementation of the new curriculum in MLR Institute of Technology, after acquiring the status of autonomous, made enormous improvements in the students' performance in terms of quality of admissions, pass percentage and placement records. Moreover, the detention of students during the course period also reduced. Some of the major parameters were discussed in below tables. Students are accomplishing project based learning like micro projects, gap lab, &D lab with the non credit courses introduced in our new curriculum. Students are motivated to participate in various competitions in reputed institutions/ organizations in India and abroad. Remarkable achievements and recognition is received by our institute through the new curriculum.

Table 5: Academic Performance improvements in pass %

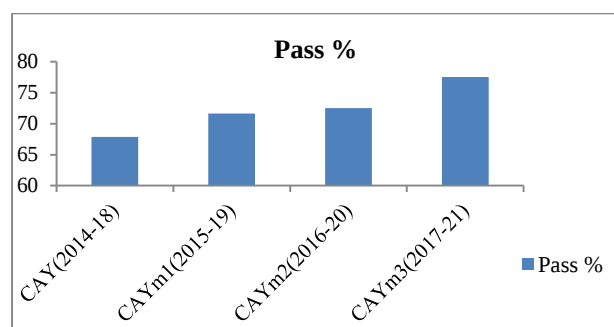
Year	(X)	(Y)	(Z)
CAY(2014-18) Non Autonomous	67.84	250	260
CAYm1(2015-19) Autonomous	71.6	266	275
CAYm2(2016-20) Autonomous	72.5	275	285
CAYm3(2017-21) Autonomous	77.5	278	285

Where

X= percentage of marks in IV Year of all successful students

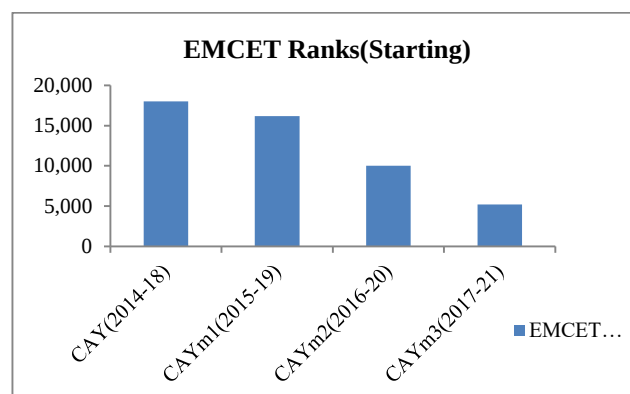
Y = number of successful students passed

Z= number of students appeared in the examination

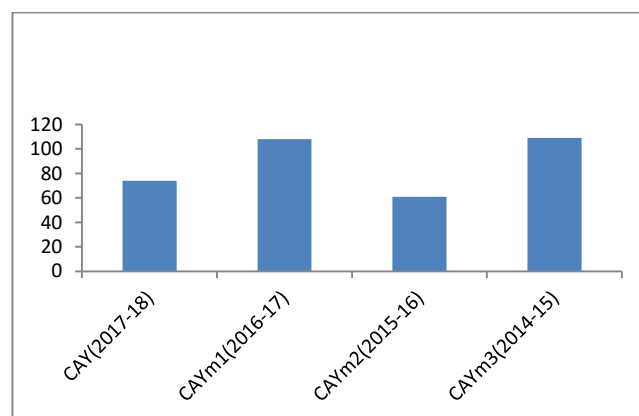
**Fig. 1 Academic Performance improvements in pass %****Table 6: Academic improvement in students Admission**

Year	Total No of Students	SSC (>75%)	Inter (>75%)	EMCET Rank (Starting)
CAY(2014-18) Non Autonomous	260	130	140	18,010
CAYm1(2015-19) Autonomous	275	172	161	16,200
CAYm2(2016-20) Autonomous	285	180	173	10,030

CAYm3(2017-21) Autonomous	285	188	182	5,200
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**Fig. 2 Academic improvement in students Admission****Table 7: Improvements in Placements**

Year	Total no of Students	No. Of Students placed
CAYm1(2017-18) Non Autonomous	285	74* (under process)
CAYm2(2016-17) Non Autonomous	280	108
CAYm3(2015-16) Non Autonomous	275	61
CAYm3(2014-15) Non Autonomous	268	109

**Fig. 3 Improvements in Placement**

8. Conclusion

From the above discussions, we can conclude that curriculum design plays a vital role in successful outcomes of students. In the recent years, our students are getting more placements in core companies. After the autonomous status of our institution, the teaching and learning process has provided enough flexibility. Results and discussion parts of this paper clearly indicate the success of students in placements, academic performances, students' admissions and higher education etc.

Acknowledgments

The authors would like to thank the management of MLR Institute of Technology, the Principal, the Department of Electronics and Communication Engineering, Department of mechanical engineering, Examination Cell, centre of innovation in teaching learning cell, placement and admission department for proving this best opportunity, required data and moral support to write the case study about the advantages of our flexible new curriculum.

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