Student Innovative Practices
towards attainment of Programme Outcomes

MAHENDRA ENGINEERING COLLEGE

AUTONOMOUS NAAC 'A' GRADE

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Student Innovative Practices at Mahendra Engineering College

Student skill development in higher education has become an important activity in engineering institutions to face the industrial demands and challenges in the recent years. In these aspects, every institution is working with various strategic plans and schemes to enhance the ability of the students to excel in their career. As we are aware, the technological developments and the fast changing industrial need demands for skill development through various practices which are the need of the day. This has motivated Mahendra Engineering College (MEC) to discuss with the stakeholders to devise various best practices to ensure that the students are provided ample opportunities to hone their skills.

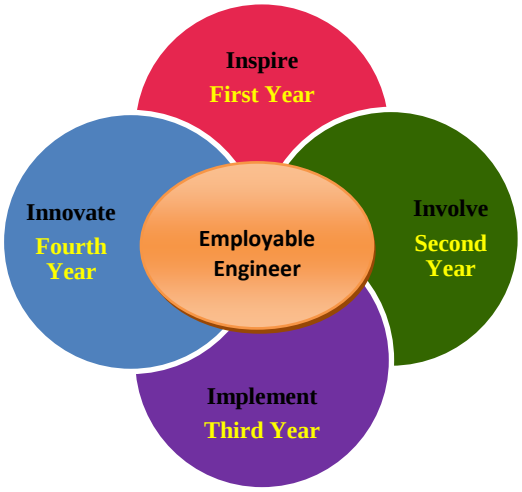
As a part of the Student Skill Development Mission (SSDM), MEC has ***i*-Mantra** for **S**tudent **S**uccess (M**i**MSS) concept which comprises ***"inspire, involve, implement and innovate"*** during the course of study. These practices are meticulously implemented through more than 25 activities. In this process, our Institution has been in the forefront in implementing the best practices to enhance the skill of the students in all dimensions for achieving excellences in academics and professional career

Objectives:

The objectives of the best practices for engaging the students in achieving academic excellence are

- To inspire the students on engineering education
- Make them understand the unknown from known concepts
- To enhance the inter-disciplinary learning through inter-department lectures
- To ensure maximum involvement of students to learn the technical and related skills
- To make them to apply the learning as presentations and projects
- To motivate the students to prepare for international certifications using the centres of excellence
- To innovate and implement projects for societal needs

In order to fulfill the above objectives, ***i*-Mantra** for student success shown in Fig is in practice at Mahendra Engineering College.



Inspire	Involve
MAILS - Mahendra Alumni Interactive Lecture Series InDeL - Inter Department Lectures by other dept faculty members Alumni Mentoring Student Mentoring	SPaCT-Students Participation Credits – Targets Student Skills Support Training Programmes NPTEL Course online certification MaSTS- Mahendra Students Tech talks Series
Implement	**Innovate**
Participation in various event ICOT course Industrial International Certification	Fishing- Faculty Idea Sharing MAGIC - Mahendra under Graduate Innovation Contest T2P - Thoughts to Product

Inspire (First Year)

During first year of study, students are provided opportunities to listen to Alumni, Motivators and industrial experts in addition to faculty members to get inspired on engineering education in general and the branch of specialization in particular.

In addition, the systematic learning practice and importance of communication is focused.

It is achieved through various given activities

SIP#1 : Mahendra Alumni Interactive Lecture Series (MAILS)

SIP#2 : InDeL- Inter Department Lectures by other department faculty members

SIP#3 : Alumni Mentoring

SIP#4 : Student Mentoring

Involve (Second year)

The inspired students will involve in the second year to excel in their branch of engineering through following activities to enhance the practice of learning and doing. It is also evaluated through

SIP#5 : SPaCT-Students Participation Credits –Targets (Symposium, workshop, project

contest, Internship / In-plant Training / Industrial Visit)

SIP#6 : Student Skills Support Training Programmes

SIP#7 : NPTEL Course online certification

SIP#8 : MaSTS- Mahendra Students Tech talks Series – to share the technical knowledge among students

Implement (Pre Final Year)

The practice of learning and doing make the students to showcase the knowledge and build confidence to interact with industry experts through various activities.

Paper presentation, participating national / international technical events , project competition

SIP#9 : ICoT course (Industrial Co-Teaching with the support of Industry experts)

SIP#10 : Industrial International Certification (LabVIEW – CLAD & CLD, Autodesk, Danfoss and Infosys campus Connect, CATIA, VMWare)

Practicing with various Centres for Excellence - Wipro Mission 10X Technology Learning Centre, Intel Intelligent Systems Design Centre, Texas Instruments Innovation Lab, AutoDesk Design academy, Harita Techserv CATIA, L&T Formwork Engineering, ANSYS and VMware Academy

Innovate (Final Year)

The inspired students involve themselves in developing new ideas and students are provided with ample space for creating new ideas through

SIP#11 : Fishing- Faculty Idea Sharing

SIP#12 : MAGIC - Mahendra under Graduate Innovation Contest

SIP#13 : T2P - Thoughts to Product

For these above practices systematic plans are devised and information is disseminated to the students and faculty members by the Head of the Institution. Once in a week, Department review meeting is held and progress of the activities monitored by the coordinators of all the activities.

SIP#1

MAILS: Mahendra Alumni Interactive Lecture Series

Alumni interactions are arranged in frequent intervals for the students to get inspired in engineering profession in general and their branch of specialization in particular.

Objectives:

- To inspire the fresher on engineering education
- To know the required skill set of the industries through alumni interaction
- To expose the students to understand the etiquettes of industries.
- To make awareness of recent technologies in Industries

Number of interactions and the students Participations

Sl.No.	Year	No. of Alumni Interactions	No. of Students benefited
1	2017-18	54	1230
2	2016-17	52	1150
3	2015-16	45	900

Outcomes:

- Motivation and involvement in students
- Students skill set in their domain
- Students familiarized with the customary code of polite behavior in Industry
- Awareness of recent technologies in Industries

PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
				√	√		√	√	√		√

SIP#2

InDeL- Inter Department Lectures

It is an inter departmental activity by the faculty members. Minimum of four faculty members in a day visit other department class to share their inter-disciplinary knowledge with allied department students to enhance the interdisciplinary activities.

Objectives:

- To motivate the students of various departments to understand and acquire the possibilities of learning in multi domain.
- To enhance the possibility of inter discipline activities across students
- To Motivate for inter disciplinary project guidance.

Number of Lectures arranged and students' participation

Sl.No.	Year	No of Lectures delivered	No of students benefited	Average number of students benefited per lecture
1	2017-18	160	6418	40
2	2016-17	133	4988	38
3	2015-16	123	4490	36

Outcome:

- Enabled the understanding of various the avenues for multi domain activities
- More enrolment in open elective offered by other department and increased utilization of other department laboratory resources
- More inter disciplinary projects done

Major Inter departmental projects done by the students

- **Solar powered Vehicle (EEE & Mech)**
- **Solar Energy tracking system (ECE & Mech)**
- **Line follower ROBOT (ECE & Mechatronics)**

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√		√		√	√	√	√	√	√		

Alumni Mentoring

SIP#3

Apart from alumni interactions through lectures in the institution, alumni are attached with the students for further guidance. More numbers of active alumni volunteers are identified and they are attached with one alumnus. Alumni will interact and support to the assigned students to enhance their learning practice to plan for the activities during the course of study to shape their career.

Objective:

To built a relationship among the students and alumni (industrial experts) to explore the maximum possible opportunities to learn

Outcome:

- Increased interactions with a alumni mentor and the associated activities.
- Focused activities of the students
- On line certification planning has increased
- Use of tools and facilities available in the department and institution has increased.

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		√		√	√		√	√	√		√

Student Mentoring

SIP#4

Fast and smart learners are identified and assigned maximum of two slow learners in their respective class. Fast learners will interact with the slow learners to identify the academic difficulties and provide the learning materials and support in order to improve the performance of slow learners.

Objective:

- To develop the group learning
- To enhance the learning skills of first-generation engineering graduate students

Outcome:

- Slow learners enhanced the learning skills
- Self confidence is witnessed in first-generation engineering students

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
				√	√		√	√	√		√

SIP#5

SPaCT-Students Participation Credits –Targets

Every department is given a target credit based on the number of students to achieve through participating in various activities (curricular, co-curricular / extra curricular). This is achieved with the support of faculty members. Each faculty member is allocated with fifteen students to motivate and guide to participate in various technical events organized by IITs, NITs, other premier universities / industrial originations and professional bodies. The participation is assigned credit points and considered for internal assessment calculation.

Objectives:

- To increase the number of participation in various activities to enhance the PO attainment
- To develop the interaction with students of other institutions
- To create involvement among all students in wide range of activities

Student's participation and credits earned through various activities

Sl.No.	Year	No of students participation	Credits earned by students
1	2017-18	766	14300
2	2016-17	753	13200
3	2015-16	650	11200

Outcome:

- More number of participation in various activities
- Elected as a students ambassador for various events organized outside the college
- Active participation in events and more prize in winners in seen

  Note: Winners are appreciated with financial support for travel and registration fees (Approx. 2.5 Lac per year)

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√				√	√			√	√		√

SIP#6

Student Skills Support Training Programmes

Students enhance their communication and employability skills in addition to life skills by actively participating in the skills development programmes organized in our institution. Leading corporate trainers are involved in this practice. Various training such as KNowledge Aptitude Communication Kit (KNACK) for second year students; Know How for third year students for soft skills and core domain technical skills and Take Ten for fourth year students for group discussions, interview and life skills are focused.

Objectives:

- To impart communication and aptitude skill among the students in addition to the regular classes
- To enhance the attitude of the students to be ethical professional
- To balance the academic and life skills
- To impart lifelong learning among the students
- To provide interview related tips to the students

Outcome:

- Improved participation in technical events like seminar and workshops
- Significant change in attitude among the students
- Enhanced confidence level of students to face the challenges ahead in working environment

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√	√						√	√	√	√	√

SIP#7

NPTEL certification

Students are motivated to take up the NPTEL certification courses offered by IITs and IISc through online. It provides an opportunity to the students to undergo courses of their choice and get certification.

Objectives

- To motivate the students to learn the concepts through eminent professors on the subject
- To improve the technical skill in their respective domain
- To enhance the teaching learning process

Sl.No.	Year	No. of student registration	No. of student certification
1	2017-18	335	Examination in April 2018
2	2016-17	51	40

Outcomes:

- NPTEL certification course enhanced the concept learning and depth of knowledge from IIT professors
- Students gained confidence on the subject
- Performance level of students on learning aspects improved

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√	√	√	√	√	√	√	√	√	√	√	√

SIP#8

MaSTS- Mahendra Students Techtalks Series

The students are encouraged and given an opportunity during 7th period on all working days with a maximum audience of 50 students to present a Technical Talk on the topic of their interest to share with peer group of students. MaSTS- Mahendra Students Techtalks Series is a practice by the student for the students.

Objectives

- To create a avenue to the students to share their innovative ideas to the peer groups and paves way to the students to generate innovative ideas and implement the same in real time projects.
- To facilitate group discussion activities
- To give preview for presentation skills of the students

Sl.No.	Year	No. of MasTS	No of Student participation
01	2017-18	203	6090
02	2016-17	102	2302
03	2015-16	52	983

Outcomes

- Innovative idea sharing and real time project are enhanced
- Students' group activities and presentation skills improved

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√				√	√		√	√	√		√

SIP#9

ICoT course- Industrial Co-Teaching

Industrial Co-Teaching courses are designed to facilitate the transfer of knowledge to the students by educating them with the support of industries. The course contents are derived in consultation with the industry experts. In general, the courses have three modules and the interested students can register one module per semester.

Objectives

- To impart advanced learning in the area of interest with the support of industrial experts
- To apply practical oriented teaching methodology
- To become an expertise in a particular field with practical knowledge

Sl.No.	Year	No. of Courses	No. of student completed
01	2017-18	8	140*
02	2016-17	4	85

Outcomes:

- Practical knowledge and the real time problems are exposed to the students
- Students activities through real time projects enhanced
- Experts from reputed industries have trained the students
- State of art technologies like IoT and Machine learning are provided through the Centres of Excellence with the support of leading industrial experts.

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√	√	√		√	√		√	√	√		√

Industrial International Certification & Centre of Excellence

SIP#10

Students are trained well through the practices and it is showcased through the participation of the students in obtaining the Industrial International Certification. College established various centers of excellence with the support of leading industries.

S.No	Name of the certifications	Numbers of certification
1	NI-LabView Academy (CLD)	17
2	NI-LabView Academy (CLAD)	210
3	AUTODESK (AutoCAD)	71
4	Danfoss (Training on Design)	2612
5	Wipro Mission 10x	61
6	Intel- FICE (IoT Systems)	202
7	Texas Instruments (Embedded Systems)	306
8	Suryamitra skill development	59
9	Infosys campus Connect	300
10	CATIA	192
11	VMware Certification	84
12	Logistic Management Skill	29
13	Dell EMC^2 Big data Analytics	100
14	Oracle Academy	80
15	ICT Academy initiates	1000

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National Instruments Award 2017 for achieving more number of certificates in the national level

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√	√	√	√	√	√	√	√	√	√	√	√

FISHing – Faculty Idea SHaring

FIP#11

This practice enables the students to generate innovative ideas and implement the same in real time projects for the day-to-day problems of the society

Objectives

- To inspire the students to generate innovative ideas and implement the same in real time projects
- To develop innovative ideas and social oriented projects from students with the support of Institution and industrial experts

Few innovative projects of the students completed out of 86 innovative ideas in 2016-17

- Solar powered vehicle
- Solar tracking system
- Agriculture Crop Monitoring system
- Automatic Indication system
- Blue tooth controlled autonomous vehicle
- Pick and place Robot
- Obstacle detection in robot using ultrasonic sensor

Outcome:

- It is witnessed through several accolades in the competitions organized by the renowned industrial organizations like Infosys, Texas Instruments, Microsoft and many academic institutions

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√	√	√		√	√	√	√	√	√	√	√

MAGIC – MAhendra under Graduate Innovation Contest

SIP#12

Mahendra Educational Trust motivates the student community to participate in the event and exhibit their talent to win the seed money to implement the project. Students are encouraged to participate in inter and intra department project contest held within the college and outside the college. A few examples: Students have participated in ICTACT powered Autodesk Inventor 3D modeling contest and Texas Instruments India WEBENCH design contest and won prizes in national level.

T2P- Thoughts to Product

SIP#13

Team of students from various disciplines proposes their innovative ideas in the Mahendra under Graduate Innovation Contest. The best innovative and social relevant ideas are scrutinized by the team of faculty members and industrial experts. Financial and technical expertise is provided by the college management and leading industrial experts to transform best innovative ideas into products.

Objectives

- To provide opportunity for exhibiting new ideas and thoughts
- To understand the complexity and intricacies in product development
- To provide scope for patent development

Sl.No.	Year	No. of ideas received	No. of ideas scrutinized and implemented
1	2017-18	86	51
2	2016-17	57	43
3	2015-16	52	22

Outcomes:

- Created awareness among the students to develop product on their own
- Need for the society is well understood in all perspective
- Possibilities of becoming entrepreneur has increased

Contribution for PO attainments:

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
√	√	√	√	√	√	√	√	√	√	√	√

Innovative Practices - Students - Contribution towards PO attainment

Activity	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Alumni Lectures					✓	✓		✓	✓	✓		✓
InDeL	✓		✓		✓	✓	✓	✓	✓	✓		
Alumni Mentoring					✓	✓		✓	✓	✓		✓
Student mentoring					✓	✓		✓	✓	✓		✓
SPaCT	✓				✓	✓			✓	✓		✓
SSST	✓	✓						✓	✓	✓	✓	✓
NPTEL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MaSTS	✓				✓	✓		✓	✓	✓		✓
ICoT Course	✓	✓	✓		✓	✓		✓	✓	✓		✓
Industrial Certification	✓	✓	✓	✓	✓				✓			✓
FISHing	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
T2P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓