MANDATORY DISCLOSURE

1	Name of the Institution	Mar Ephraem college of Engineering and Technology
	Address of the Institution	MALANKARA HILLS, ELAVUVILLAI, KANYAKUMARI, ELAVUVILAI,KANYAKUMARI, Tamil Nadu, 629171
	City & Pin Code	Marthandam - 629171
	State / UT	Tamil Nadu
	Phone Number with STD Code	04651-271111
	Mobile Number	9443483072
	Fax Number with STD Code	04651270158
	Office hours at the Institution	8.45 a.m. to 4.30 p.m.
	Academic hours at the Institution	9.00 a.m. to 4.30 p.m.
	E-Mail	marephraem@gmail.com
	Website	www.marephraem.edu.in
	Nearest Railway Station (Distance in KM)	Kuzhithurai (5 kms)
	Nearest Airport (distance in KM)	Trivandrum (51 kms)
	Type of Institution	Self Financing
	Category (1) of the Institution	Christian Minority
	Category (2) of the Institution	Co-Education
2	Name and address of the Trust	THE DIOCESE OF MARTHA DAM TRUST
	Type of the organization	Trust
	Address of the organization	Bishop's House, Vettuvenni, Marthandam
	Phone Number with STD Code	04651-272158

3	Name of the Vice Chancellor / Principal / Director	Dr.A.Lenin Fred M.E., Ph.D. / Principal
	Exact Designation	Principal
	Address of the Principal	MALANKARA HILLS, ELAVUVILAI, MARTHA DAM, KANYAKUMARI,
	Mobile Number	9443483072
	E-Mail	leninfred.a@gmail.com
4	Name of the affiliating University	Anna University
	Address	Guindy, Chennai – 600 025
	Website	www.annauniv.edu
	Latest affiliation period	2019-2020

Governance

- GoverningCouncil

Sl.No	Name of the Member	Designation	Role inGoverning Body
1	His Excellency Most Rev.Dr.Vincent Mar Paulos	Bishop of Marthandam Diocese	Chairman
2	Rt. Rev. Msgr. S. Varghese	Vicar General, Diocese of Marthandam	Convener
3	Rev.Fr.Josephin Raj	Correspondent, Mar Ephraem College of Engineering and Technology	Secretary
4	Very Rev. Fr. Sunny Mathew	Chancellor, Diocese of Marthandam	Member
5	Very Rev. Fr. Satheesh Kumar	Procurator, Diocese of Marthandam	Member
6	Very Rev.Fr.Jose Bright	Correspondent,MCC	Member
7	Very Rev. Fr. John Kumar	Priest Representative	Member
8	Mother. Anila Christy D. M	Religious Representative	Member
9	Mr. Paul Raj	Industrial Representative	Member
10	Dr.Vinu	Academician	Member
	Frequency of meetings	Once in a year	

Sl	Name	Designation	Role
1	Dr.A.Lenin Fred	Principal	President
2	Dr.N.Austin	Director	Member
3	Sr. Ancy Mathew	OS	Member
4	Mrs. PriyaViji	HOS	Secretary
5	Dr.Suresh	HOS	Member
6	Dr.D.Rajeev	HOS	Member
7	Dr. AnandRejilin	HOS	Member
8	Mr. Anish John Paul	HOS	Member
9	Mr. AshwinSingerji	HOS	Member
10	Dr.G.Prince	Librarian	Member
11	Mr.R.Leo Bright Singh	PRO	Member
12	Mr.S.Arun	Staff Secretary	Member

Academic Council: MEMBERS OF THE ACADEMIC COUNCIL (As on 1.7.2019)

Frequency of meetings	Twice in a year
-----------------------	-----------------

Organizational chart



Student feedback mechanism on Institutional Governance / faculty performance				
Parent – Teachers Associations in every class / branch of study, class committee of staff and students, college committee of senior professors and a disciplinary committee help smooth functioning of the college. They meet periodically, discuss and decide on good governance and implementation. Feedback on faculty performance is collected from students. These forums also provided very purposeful feedback for analyzing and improving uponprocedures.				
Grievance redressal mechanism for faculty, staff and students				
• If a complaint is received from a student, it will be handed over to the Principal immediately.				
• Principal in consultation with college council will hand over the complaint to the grievance redressal committee.				
• The committee will enquire about the complaints within the stipulated time and the report will be handed over to the Principal.				
• The committee report will be discussed in the college council and the council will decide the disciplinary action.				
• The action will be informed to the parents also.				
• The parents along with the accused students have to meet the Principal before the student is permitted to attend the class.				
• If there is issue of serious manhandling the matter will be reported to the police.				
• In the case of academic grievances the matter will be handed over to the Head of Department for enquiry and report.				
• Principal will suggest suitable measures based on the report.				
Establishment of Anti Ragging Committee				

Sl.No	Name	School	Designation	Role
1	Dr.N.Austin	Mech	Professor	Member
2	Mr.Vinoth	H&S	A/P	Coordinator
3	Mr.Sam Paulson	Physical Education	PD	Member
4	Mr.StanleyJino	Men's Hostel	Deputy Warden	Member
5	Mr.Rajesh	Men's Hostel	Deputy Warden	Member
6	Sr.Leena Mathew	Women's Hostel	Deputy Warden	Member
7	Sr.Navin	Women's Hostel	Deputy Warden	Member
8	Sr.Annamal	Counsellor	Counsellor	Member
9	Dr. Rajeev	Mech	HOS	Member
10	Dr. AnandRejilin	Civil	HOS	Member
11	Prof. Dr.Suresh	ECE	HOS	Member
12	Mr. AshwinSingerji	CSE	HOS	Member
13	Mr. Anish John Paul	EEE	HOS	Member
14	Mrs. PriyaViji	H&S	HOS	Member
15	Mr.Ajesh V.S	Mech	Student	Member
16	Mr.Nitha Mohan	CSE	Student	Member

Establishment of Online Grievance Redressal mechanism	Online Grievance Redressal Mechanism is
	available and it is look into by the Grievance
	RedressalCommittee.

Establishment of Grievance Redressal Committee in the Institution and Appointment of

Members Name Department		Designation	Role
Mrs.Seema	H&S	A/P	Convenor

Mr. Vijayakumar	Mech	A/P	Member
Mrs. Manju Ram	Civil	A/P	Member
Mr. Stanley	Hostel	Deputy Warden	Member
Mrs. Suja	Chemistry	Lab Assistant	Member

Establishment of Internal Complaint Committee:	Committee constituted as per norms
Establishment of Committee for SC / ST:	Committee constituted as per norms
Internal Quality Assurance Cell :	IQAC is formed and periodical audit is being done.

Programmes

S. No.	Degree	Branch	Year of Starting	Intake	Duration	Accredition status
1	B.E.	Civil Engineering	2009	120	4 years	Applied
2	B.E.	Mechanical Engineering	2009	120	4 years	Applied
3	B.E.	Electrical and Electronics Engineering	2012	60	4 years	Not Applied
4	B.E.	Electronics and Communication Engineering	2009	120	4 years	Not Applied
5	B.E.	Computer Science and Engineering	2009	60	4 years	Applied
6	M.E.	Manufacturing Engineering	2013	18	2 years	Not Applied
7	M.E.	Applied Electronics	2013	18	2 years	Not Applied
8	M.E.	Computer Science and Engineering	2012	18	2 years	Applied

Fees in INR (per annum)

Course	NBA Status	2021-2022
	Non-Accredited	50,000
	Management quota (Non-Accredited)	80000

Faculty

ſ

Branch wise list Faculty members:				
Civil Engineering	http://marephraem.edu.in/pages/schools/civil-			
Civil Engineering	engineering/civil-faculty.php?id=5			
Computer Science & Engineering	http://marephraem.edu.in/pages/schools/computer-			
Computer Science & Engineering	engineering/computer-faculty.php?id=20			
Electronics & Communication	http://marephraem.edu.in/pages/schools/electronics-			
Engineering	communication-engineering/ece-faculty.php?id=50			
Electrical & Electronics	http://marephraem.edu.in/pages/schools/electrical-			
Engineering	electronics-engineering/eee-faculty.php?id=35			
Machanical Engineering	http://marephraem.edu.in/pages/schools/mechanical-			
Mechanical Engineering	engineering/mechanical-faculty.php?id=65			
Science And Humanities	http://marephraem.edu.in/pages/schools/science-			
	humanities/sh-faculty.php?id=77			

	Profile of Principal			
Name		Dr. A Lenin Fred		
Date of Birth		18/05/1974		
Unique ID		1-470342541		
Education	Qualification	B.E.,M.E.,Ph.D.		
	Teaching	24.3		
Work	Research	17		
Experience	2			
Area of Specialization		IMAGE PROCESSING		
Course taught at Diploma /Post Diploma / Under Graduate / Post Graduate DiplomaLevel		UG & PG level		
No.of paper published in National / International Journals /Conference		58		
guidance	Master			
	Ph.D	7 COMPLETED, 9 ONGOING		
Project Ca	rried out	20		
Patents		10		
Technolog	y Transfer	1		
Research Publications		International Journals -56, National Conference – 02		
No.of Books published with details		4		
		Suspicious Lesion Segmentation on Brain		
		Mammograms and Breast MR Images using New		
		Optimized Spatial Feature based Super-Pixel Fuzzy		
		C-Means Clustering. Journal of Digital Image		
		Processing Innovating Imaging Informatics, Springer		
		Book Chapter, DOI: 10.1007/s10278-018-0149-9		
		Nature Inspired Optimization Techniques for Image		
		Processing Application, Springer Book Chapter,		
		DOI: 10.1007/978-3-319-96002-9		

Hybrid Machine Intelligence for Medical Image
Analysis, Studies in Computational Intelligence,
"Segmentation of Anomalies in Abdomen CT
Images by Convolution Neural Network and
Classification by Fuzzy Support Vector Machine",
Volume 841, Springer Book Chapter, DOI:
10.1007/978-981-13-8930-6_7
Lossless Compression of CT Images by an
Improved Prediction Scheme Using Least Square
Algorithm, Circuits, Systems, and Signal Processing
ISSN 0278-081X Circuits Syst Signal Process, DOI
10.1007/s00034-019-01152-8, Springer Book

Admission

Enrollment of students in 2021-2022

Department	Intake sanctioned	Admitted
Civil	120	45
CSE	60	60
ECE	60	54
EEE	60	29
Mech	120	76

AdmissionProcedure

- 1. Enquire at the reception about the availability of seats, eligibility criterion and the admission procedure.
- 2. Application for admission should be made in the prescribed form given by the Institute in person or online through the website of Institute.
- 3. Copies of the relevant certificates have to be submitted to the office when called for scrutinizing the application.
- 4. Selection of candidates for admission is purely a prerogative of the Institute.
- 5. Selected candidates

They will be formally scrutinized. If they are in order, the filled in application form will be collected and challans will be given for paying the fee at the Cash counter .Submit the original certificates to the office.

- 6. Once the counter foil of paid challans is returned, the admission process will be completed.
- 7. Candidates will be admitted in the allotted branch /programme

*The government quota students have to follow the steps 3-6, after getting the provisional allotment in the single window counselling.

Documents to be produced for Admission to B.E./M.E Degree Courses

- HSC/B.E./B.Tech./UG Degree Statement of Marks
- Transfer Certificate
- Conduct Certificate
- Community Certificate
- Copy of Aadhar Card
- Passport Size Photos -4 Nos.

*Tuition and other fees prescribed by the College should be paid in full before the starting of the classes every year.

*The decision of the Management will be final in all matters regarding admission, training and discipline and will be binding on all parties concerned.

	Nos (Qty)	Average Area in Sqm.	
Number of class rooms and size of each	34	68	
Number of Tutorial rooms and size of each	15	40	
Number of Labaratories and size of each	40	80	
Number of Workshop and size of each	5	200	
Number of class Drawing Halls with capacity of each	2	140	
Number of computer centres with capacity of each	2	273.09	
Number of LanuageLabaratories with capacity of each	2	138.01	
Barrier Free Built Environment for disabled and elderly persons	Avai	lable	
Occupancy Certificate	Available		
Fire and Safety Cerificate	Available		
Hostel Facilities	Available in the campus for 2,206 Boys and 1,276 Girls		

Information of Infrastructure and other ResourcesAvailable

<u>Placement</u> <u>http://www.marephraem.edu.in/pages/resources/training-and-placement.php?id=16</u>

Library

Number of Library Books / Titles / Journals available (Program wise)

Programme	Number of Titles	Number of Volumes	Number of Journals	Number of eBook Titles	Number of eBook Volumes
-----------	---------------------	----------------------	-----------------------	---------------------------	-------------------------------

ENGINEERING AND	7253	19052	115	
TECHNOLOGY	1255	17052	115	

e – Library facilities

Digital Library with sufficient number of systems with e - books and e - Journals available in Central Library

1	Civil Engine ering	http://www.marephraem.edu.in/pages/sc hools/civil-engineering/civil- laboratories.php?id=
2	Comp uter Scienc e	http://www.marephraem.edu.in/pages/sc hools/computer-engineering/computer- laboratories.php?id=21
3	EEE	http://www.marephraem.edu.in/pages/sc hools/electrical-electronics- engineering/eee-laboratories.php?id=36
4	ECE	http://www.marephraem.edu.in/pages/sc hools/electronics-communication- engineering/ece-laboratories.php?id=51
5.	MEC H	http://www.marephraem.edu.in/pages/sc hools/mechanical- engineering/mechanical- laboratories.php?id=66
6	S&H	http://www.marephraem.edu.in/pages/sc hools/science-humanities/sh- laboratories.php?id=78

COMPUTING FACILITIES

Internet Bandwidth		50 MBPS
Number and configuration of system		405 systems Configuration consisting of Core2Duo, i3, i5, i7
Total number of system connected by LAN		405
Total Number of system connected by WAN		405
Major software package available		
System software	1. LINU 2. LINU	JX- Centos6.9 JX-UBUNTU
Special purpose facilities available Digital /		/ e – Library, 3D Printer,

List of facilitiesavailable

Games and Sports Facilities	Available
Extra – Curricilar Activities	Available

Soft Skill Development Facilities	Available
-----------------------------------	-----------

List of Research Projects/ ConsultancyWorks

FUNDED PROJECTS DETAIL

Project Title N o	Dated with No	oject dur ati on	ect starting built dect starting cy	Fotal Grant	Grant Relea sed	Status
	2019 - 2020					
IOT Based Smart cattle farm with hydroponic feeder system	DST/TDT/AGRO- 15/2019(C)	'ears	DST 10 - 12 - 2019	72,33,668/-		Ongoing
2019-2020						
A Proof of Concept: Design of master controller for assisting the fire rescue team with optimal path guidance in human detection	RMREB/STE/2019/21 4	<i>y</i> ears	0RDO 6102 - 90 - 61	15,56,495/-		Ongoing
2018 -2019						

Proof of Concept:	ST/TM/WTI/2K16/1 96(G)	year		DST	9,90,717/-		Ongoing
Design and Development	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
of a Portable							
Image			6				
processing			016				
based system			il2				
for the			Api				
identification			1				
bacteria in							
drinking							
water							
		2017-2	2018				
IoT Enabled		vears		ТДТ	54 47 609/-		Ongoing
Cordial	dated 4.12.2017	Cuis		101	, 17,0027		ongoing
Analyzer for							
Farmers: A			×				
Spot			201				
Analyzer with Agilo			01.1				
Sensing			22.				
Technologies							
for Smart							
Irrigation							
Human MR	TU Ref: RCA-17/334	<i>y</i> ears		anyang		-	
Image				Univ			Ongoin
System				ersity			oligoini g
Bystem				, Singa			5
				pore			
	2016-2	2017	T	I	1	ſ	
evelopment of	IDP/MED/03/2015	years		DST	34,38,4		Completed
a portable					00/-		
for medical							
image							
analysing,			9				
compression			010				
and)5.2				
transmission			13.(
for CT/MPI							
low slice							
thickness							
images							

evelopment of	DST/SSTP/TN/377	vears		DST	37.69.6		Completed
Automated					51/-		I I I I I I I I I I I I I I I I I I I
Rubber					01/		
tapping							
tapping mashing to							
inachine to			16				
improve the			20]				
socio-			5.7				
Economic			1.0				
Status of			0				
Rubber							
Growers in							
Rural Areas							
evelopment of	PO/RES/3/710/16-17	Vear		SRO	10.85.000/-	85.00	
evelopment of	$\Lambda TED Mov 16 2016$	ycai		DECD	10,05,000/-	,05,00	
customized	DATED May 10,2010			KESP		0/-	Comml
software for				OND			Compi
the Data			9				ete
Management			01				d
related to			6.2				
integration of			0.4				
Cryo Upper			17				
Stage(CUS-							
SOFT)							
"Manage		6		Volkite	6 30 000/-		
mant		0		Univ	0,50,000/-		
Inelit							
Infor		nth		ersity			
matio		S					
n							
Syste							
m"							
for							
Wolki							
te							
Unive							
reity							
Isity							
Davalor		2		Vollzita	2 10 000/		
Develop		5			2,10,000/-		
ment		mo		Univ			
of		nth		ersity			
Dyna		S					
mic							
Webs							
ite for							
Wolki							
te							
Unive							
roity							
ISITÀ							

FUNDED WORKSHOPS DETAIL

Sl	Project Title	Dated with No	Funded	Total	Grant	Status
No			Agency	Grant	Releas	
					e	

			1		1	
		2018 2010				
1	Completed					
1.		D/D/FP/813/2018 DATED:		00 000/		Completed
		01.10.2018		,00,000/		
	ive shill for		DIVISI	-		
	ive skill for		UN			
	tribal					
2	INCDIDE	T/INSDIDE/01/2018/0004	DCT	00.000/		Completed
۷.	INSPIKE	82	DST	,00,000/	,00,000/	Completed
	Science	85		-	-	
	Comp 2019					
2	tranranaurshi	EDII/DST NIMAT/18	DST	0.000/	8 000/	Completed
5.	nepreneursm	$\frac{10}{\text{PLS}} \frac{1}{1005}$	DST	0,000/-	8,000/-	Completed
	p A succession	19/KLS-1/093				
	Awareness Comm(EAD	Dated 07/08/2018				
	Callip(EAD					
	-0,7,0)	DMKVV TI	AICTE		77.020/	Dotoh III
4.	NSC-SKIII		AICTE		1400	
	developmen				+1490	ongoing
	l				40	
		2017-2018				
		2017-2010				
5.	INSPIRE	ST/INSPIRE/01/2017/0009	DST	,00,000/	,00,000/	Completed
	Internship	05			-	1
	Science					
	Camp 2018					
6.	trepreneurshi	EDII/DST-NIMAT/17-	DST	0,000/-	0,000/-	Completed
	р	18/257				-
	Awareness	Dated 26/04/17				
	Camp(EAD					
	- 3,4,5)					
7.	NSC–Skill	PMKVY-TI	AICTE		66,000/-	Batch I& II
	developmen					completed
	t					-
		2016-2017				
			DOT	00.000/	br. 000/	
8.	VIPNET	VP/058/33/A&A/14	DST	28,000/	95,200/-	Complete
	Orientation	Dated: 29.02.2016			32,800	d
	Workshop					
	for Tribal					
	School					
	Teachers		DCT	0.000/	4.000/	C 1
9.	trepreneurshi	D/DST-NIMAT/16-17/190	DST	0,000/-	4,000/-	Complete
	р	Dated: 25.05.2016				d
	Awareness					
	Camp(EAD					
10	- 1)		DOT	0.000/	4.000/	
10.	trepreneurshi	DI/DST-NIMAT/16-17/190	DST	0,000/-	4,000/-	Complete
1	р	Dated: 25.05.2016				d

	Awareness Camp(EAD - 2)					
11.	INSPIRE	ST/INSPIRE/01/2016/0003	DST	75,000/-	00,000/-	Complete
	Internship	84			,75.000	d
	Science	Dated: 15.06.2016				
	Camp					
12	NSC–Skill	IKVY-TI	AICTE		91,600/-	Complete
	developmen					d
	t					

LoA and subsequent EoA till the current Academic Year

Accounted audited statement for the last three years:

http://www.marephraem.edu.in/pages/about-us/financial-statement.php?id=10

Best Practices adopted

REPORT OF BEST PRACTICE

Civil Engineering

Best Practices in Civil Engineering Department

Goal

The goal of this practice is to appreciate the work done by the students of the institute and motivate them to excel in their areas of expertise. This practice would ensure continuous improvement in their performance as per the quality policy to achieve the Vision and Mission of the institute.

Students Involvement in Consultancy Activities:

The students of the department of civil engineering involve in consultancy activities along with the faculty members. This practice will enhance the students knowledge and the students will gain hands-on experience on industrial practice.

The Consultancy activities includes

- 1. Surveying by Total Stations
- 2. Testing of Construction Materials
- 3. Mix Propositioning of concrete and
- 4. Testing the quality of water.

Moreover, the skill sets of the students will also improve by implementing the theory concepts during consultancy activities

Students Involvement in Funded Projects:

The students of the Department of Civil Engineering involve in funded projects with the

faculty members. This introduces students to the joy of discovery and makes the process of learning an active rather than a passive one. This will help the students decide on a career path.

Though education is supposed to be an evenly balanced process of theory and application, the college exams often test just the theory part. Most of the marks that the students get are for what they write from their memory. Yes, there are those numerous equations and problems to be solved. But most of that is solved using the pen and paper. The real world demands more than that.

This is where doing a project for a few of the subjects in a particular semester comes into the picture. Projects help the students in understanding the subject better which in turn leads to remembering what we have studied for a longer duration of time. The students will definitely remember a lot of things through project. Projects encourage us to dig deeper & help us learn new things. Projects make learning more learner driven than teacher driven.

And suppose there is a group of friends who are working on a project, think of the many ideas that can be thought of while working as a team. Brainstorming with like minded individuals offers new insights into the problems. There is a lot to gain for each of the team members if everybody works together.

Projects encourage the students to dig deeper & help them learn new things. Projects make learning more learner driven than teacher driven.

The funded projects make the students to enhance society by advancing knowledge through scientific theories, concepts and ideas.

The bridge between the theoretical aspects and real world is project based learning. However, in engineering curriculum, projects are for the final year students.

The skills that the students learn by doing projects make them better prepared for the industry.

Electronics and Electrical Engineering







Participation of students in research by three tier system

- Faculty expert in a thrust research area
- Two P.G students under a faculty
- Three to four U.G students of the third year under a P.G student

Hence a faculty, a P.G student and three to four U.G students form a research team.

- The challenges from the society are identified, prioritized and listed for the students to come up with innovative ideas.
- The student selects an area of interest and identifies few problems in their second year (third semester), every concept in the course in the semester are applied with micro projects.
- Every semester students are encouraged to take mini projects towards the solution of the problem identified.
- Students are involved in funded research projects conducted in the campus.
- Motivation is given to participate in conferences, experts talks and to publish papers in reputed journals.
- Project expo is conducted every year and the best research projects are awarded.
- Separate Research fund is allocated to the students and the staff by the management to encourage research.

MECHANICAL ENGINEERING

Innovations:

1. Peer Learning groups lead by Advanced Learners

The main benefits of peer learning include, but are not limited to, the following:

- **4** Students receive more time for individualized learning.
- **4** Direct interaction between students promotes active learning.
- **4** Peer teachers reinforce their own learning by instructing others.
- **4** Students feel more comfortable and open when interacting with a peer.
- 4 Peers and students share a similar discourse, allowing for greater understanding.
- **4** Peer teaching is a financially efficient alternative to hiring more staff members.
- **4** Teachers receive more time to focus on the next lesson.

Students learn a great deal by explaining their ideas to others and by participating in activities in which they can learn from their peers. They develop skills in organizing and planning learning activities, working collaboratively with others, giving and receiving feedback and evaluating their own learning. Peer learning is becoming an increasingly important part of many courses conducted at school of Mechanical Engineering, Mar Ephraem College of Engineering and Technology.

Formalized peer learning can help students learn effectively. At a time when college resources are stretched and demands upon staff are increasing, it offers students the opportunity to learn from each other. It gives them considerably more practice than traditional teaching and learning methods in taking responsibility for their own learning and, more generally, learning how to learn. It is not a substitute for teaching and activities designed and conducted by staff members, but an important addition to the repertoire of teaching and learning activities that can enhance the quality of education.

We define peer learning in its broadest sense, then, as "students learning from and with each other in both formal and informal ways". The emphasis is on the learning process, including the emotional support that learners offer each other, as much as the learning tasks itself. In peer teaching the roles of teacher and learner are fixed, whereas in peer learning they are either undefined or may shift during the course of the learning experience. Staff may be actively involved as group facilitators or they may simply initiate student-directed activities such as workshops or learning partnerships.

As mentioned earlier, it is important to recognize that peer learning is not a single practice. It covers a wide range of different activities each of which can be combined with others in different ways to suit the needs of a particular course.

Following group flow charts were created for each year to formalize the peer learning groups. Figure: 1 shows the peer learning group structure for second year, figure: 2 for third year and figure: 3 for fourth year UG students.



Figure: 1 – Peer learning group structure for Second year Mechanical Engineering students.



Figure: 2 – Peer learning group structure for Third year Mechanical Engineering students.



Figure: 3 – Peer learning group structure for Fourth year Mechanical Engineering students.



Figure 4: One of the Peer learning groups from second year lead by student tutor Mr. Denny Johnson from third year interacting with second year students Mr. Hithesh Jose, Mr. Gautham Krishna, Mr. Akshay V. Nair, Mr. Dominic Thomas, Mr. Aravind A. Kurup, Mr. Amal V. Skaria, Mr. Ajo J. S, Mr. Akhil Raj and Mr. Benish Jebin .S



Figure 5: One of the Peer learning groups from third year lead by student tutor Mr. Paul Stephen from fourth year interacting with second year students Mr. Emil Kurikesu, Mr. Abi Mlessing .M, Mr. K.V. Jayajith, Mr. Ajin .J.S, Mr. Arun .X, Mr. Nishanth .C, Mr. Prinson Varghese, and Mr. Anish Shurbin.



Figure 6: One of the Peer learning groups from fourth year lead by student tutor Mr. Gokul Sundaresan from fourth year interacting with his classmates Mr. John Kershome, Mr. Deffin Issac, Ms. Diji, Mr. M. Jerin and Mr. Binso Thomas.

2. Inductive Approach in Learning

A better way to motivate students is *inductive teaching*, in which the instructor begins by presenting students with a specific challenge, such as experimental data to interpret, a case study to analyze, or a complex real-world problem to solve. Students grappling with these challenges quickly recognize the need for facts, skills, and conceptual understanding, at which point the teacher provides instruction or helps students learn on their own.

Inductive teaching methods come in many forms, including discovery learning, inquiry-based learning, problem-based learning, project based learning, case-based teaching, and just-in-time teaching.

In the School of Mechanical Engineering, Mar Ephraem College of Engineering

and Technology, What inductive methods have in common is that students are presented with a challenge and then learn what they need to know to address the challenge. The methods differ in the nature and scope of the challenge and in the amount of guidance students receive from their instructor as they attempt to meet the challenge.

For the second year students Fluid Mechanics and Machinery course problems were given as challenges (Figure: 7). For the third year students Heat and Mass Transfer course problems were given as challenges (Figure: 8). For the fourth year students Process Planning and Cost Estimation course problems were given as challenges (Figure: 9). Students shows their involvement while solving the given challenges by collecting data from the Laboratory and related the theories.



Figure 7: Second year Course instructor Mr. Gigin Durai delivering a challenge from the course Fluid Mechanics and Machinery to the second year students Ms. Ajasha, Mr. Alphin, Mr. Abinesh, Mr. Anish, Mr. Akilan, Mr. Abin and Mr. Abilash.



Figure 8: Third year Course instructor Mr. C. K. Joseph Bencier delivering a challenge from the course Heat and Mass Transfer to the third year students Ms. Anisha, Ms. Asha, Mr. Jibin Easow Jsmes, Mr. Ron Roi, Mr. Jenin Reji, Mr. Jerin John, and Mr. Joseph Sebastin.



Figure 9: Final year Course instructor Mr. Vijayakumar delivering a challenge from the course Process Planning and Cost Estimation to the fourth year students Mr. Xavier Vinoj, Mr.Aravind, Mr. Ajinesh, Mr. Subash, Mr. Gokul, Mr. Sajin, Mr. Pravin Babu, Mr. Rabin Raj, Mr.Roble Surian and Mr. Partheeban.

Best Practices:

1. Student Involvement with Rural Schools

Students of School of Mechanical Engineering, Mar Ephraem College of Engineering and Technology have a great concern about the nearby rural community. They strive hard to the upliftment of the students studying at the rural schools. They support the school students to get trained in Aptitude and science quizzes. Moreover, they train the school students in communication skills.

Following schools were visited by our students.

- 1. Government Higher Secondary School, Palukal.
- 2. Government Higher Secondary School, Thickurichy.
- 3. Government Tribal Higher Secondary School, Arukani.
- 4. Government High School, Kaliyal.

- 5. Ourzulas Convent, Kulesehahram.
- 6. KABD Higher Secondary School, Kootalamoodu.
- 7. MJK Higher Secondary School, Marthandam.



Figure 10: One of our students Mr. Y. Alex conducting communications skills class for the school students at the Government Higher Secondary School, Palukal.

2. Technology intervention for social change

Mar Ephraem College of Engineering is surrounded by a rural community, which involves in various activities like brick making, coconut production, rubber milk extraction, cashew nut shell removal etc.

School of Mechanical Engineering, Mar Ephraem College of Engineering and Technology have a close contact with the Marthandam Integrated Development Society (MIDS). The students of Mechanical Engineering conduct field survey in the nearby rural community and support their needs by providing solution to the day to day life problems faced by them. Enthusiastically students show their involvement in design and fabrication project by taking a challenge for the social change.

Following are the few lists of projects developed by the students to serve the nearby social needs.

- 1. Design and fabrication of coconut de-husking machine.
- 2. Design and fabrication of staircase climbing trolley.
- 3. Design and fabrication of Coconut tree climber.
- 4. Design and fabrication of Sand Sieving Machine.
- Design and Fabrication of Body Frame for semi Automatic rubber Tapping Machine.
- Design and Fabrication of Slider and Cutter for Semi Automatic Rubber Tapping Machine.

- Design and Analysis of Mechanical Module for Automated Rubber Tapping Machine.
- 8. Design and Fabrication of Brick lifter.



Figure 11: Students demonstrating the coconut climbing machine.



Figure 12: Coconut De-husking machine developed by the students.



Figure 13: Rubber tapping machine proto-type developed by the students.



Figure 14: Student involved in the fabrication of staircase climbing trolley.