

FAER – Motorola Solutions

Technology Barrier Reduction Program

(TBRP)

21st April - 16th May 2014

Institutions:

NMAM Institute of Technology, Udupi

PES College of Engineering, Mandya

Sri Siddhartha Institute of Technology, Tumkur



FAER



**MOTOROLA SOLUTIONS
FOUNDATION**

**Foundation for Advancement of
Education and Research**

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Table of Contents

1. Introduction	5
2. Acknowledgements	8
3. Introduction to Premier Engineering Institutions	10
4. Introduction to ICT	12
5. Program Objectives	15
6. Role of Premier Engineering Institutions	16
7. Selection of Students	17
8. Program Overview	18
8.1 Important Dates	
8.2 Tentative Topics & schedule	
9. Induction Program for organizers	21
10. Committee	22
11. Roles & responsibilities	23
12. Contact List	26
13. Abbreviations	28

1. INTRODUCTION

While we have a good educational system in place in general, it works well in parts and for only some section of the community. There are many felt needs for conducting activities to enhance the quality of the educational system, making it relevant and current so that it motivates the students, provides them with basics and equips them with relevant skills needed by the industries. Information availability to all, particularly to the rural poor is very low despite technological changes. Though industry interaction is found to be very desirable, the actual participation is not up to the required level.

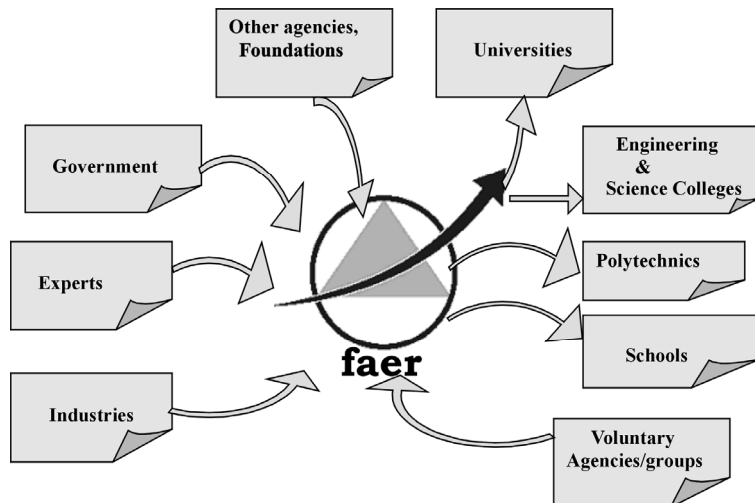
Further the fast changes taking place in the technological fields mean that the faculty has to upgrade their knowledge levels of current technologies. Hence, we need a flexible, private approach to bring together industrialists and educationists in order to provide knowledge inputs to faculty so as to improve their skills; to prepare and deliver learning resources to users - both students and teachers and reduce the digital divide.

Modern trends in many technologies like Computers, MEMS, Wireless, RF devices, automation, Biotechnology, Nano devices, Smart materials, Software technologies etc., need to be introduced into our institutional cultures. So in order to generate and conduct activities towards this end and to be a focal point for the fusion of technocrats, engineers, industrialists, educationists, teachers and students, a non-profit, registered trust named Foundation for Advancement of Education and Research **FAER** has been set up in 2004 by a group of academics & industrialists after detailed discussions.

The foundation focuses on faculty empowerment programs, students training schemes, encouragements for experimentation, and creation of a framework for curriculum for engineering colleges and polytechnics.

The main objectives of the foundation are

- To bring together industry leaders and academics so as to take up several short duration activities like faculty development programs in engineering colleges and polytechnics, technology leadership programs, laboratory developments, initiation of research in new areas, development of learning resources for various topics and long term post diploma / graduate programs in engineering areas.
- Introduction of new innovative programs, setting up of new institutions, development of inexpensive devices and kits for use by all including rural institutions and schools, etc.
- The domain of the foundation is not restricted to one state or region or country. It will provide catalytic role in several educational innovations in collaboration with other institutions and industries. It has already succeeded in networking with several organizations and industries. The foundation will work with concerned agencies to reduce digital divide and information divide and promote sustainable development of rural areas and underprivileged sections of the society. The structure of operation and linkages are shown in the diagram.



Technology Barrier Reduction Program

It has received enormous support from industry experts and academic faculty as well as academic institutions, industries, foundations and governments.

The foundation has been successful in bringing out talents from institutions in small towns and creating an enthusiasm for experimental projects. This is still very small considering the number of students in our country.

The foundation has conducted business plan contests with Department of Science and Technology, Government of India and Intel and candidates selected by FAER have got runner up awards for two years at the International contest held at University of California, Berkeley, USA. The foundation has recently conducted a full semester course work reaching various institutions in the country through an inexpensive low bandwidth video IP streaming technique. The course was on recent trends in computer architecture with faculty from IIT, IISc, Intel and IBM. This course was very successful and can be replicated to reduce problems of faculty shortage.

FAER has been playing a very important role in bridging the gap between Industries and Academic Institutions by way of conducting a series of Faculty Development Training Programs. These programs are conducted by the industry experts wherein the current trends in various technology fronts are brought to the faculty with adequate theory and hands on practical sessions.

One of such programs organized by FAER in association with Computer Society of India was a 3-day Faculty Development Program in Bangalore during 18.12.2012 - 20.12.2012. As a part of the India Celebrations of the Birth Centenary of Alan M. Turing, this program included lectures by eminent speakers on Turing, Cryptography, Computing, Algorithms, Artificial Intelligence etc as well as a Panel Discussion. Faculty from the disciplines of Mathematics, Statistics, Computer Science and Engineering, Information Technology and related fields and practicing professionals from Research Labs and Industries were invited.

Technology Barrier Reduction Program

2. ACKNOWLEDGEMENTS

Institutions

- Motorola Solutions Foundation
- Department of State Education Research and Training (DSERT), Government of Karnataka
- Integra Micro Systems, Pvt. Ltd., Bangalore
- NMAM Institute of Technology, Nitte
- PES College of Engineering, Mandya
- Sri Siddhartha Institute of Technology, Tumkur

DSERT

- Shri S. R. Manahalli, Director, DSERT

Steering committee

- Dr. V.Sridhar PESCE - Mandya
- Dr. K.A. Krishna Murthy SSIT - Tumkur
- Dr. Niranjana N. Chiplunkar NMAMIT - Nitte
- Mr. Manjunath SADPI, DSERT
- Dr. Shashank Garg Handsrel
- Mr. John Bosco Abraham BHEL
- Ms. Padmapriya Ramanujan Motorola Solutions

Organizing committee

- Mr. T.K. Ramesh Integra Micro Systems
- Dr. S.G.S. Swamy KSCST
- Mr. K.N.Venkatesh KSCST
- Mr. Krishna Bhagavan Motorola Solutions

- Ms. Indu Srinivasachar Motorola Solutions
- Mr. Shekar Muniven Motorola Solutions
- Ms. Sabitha Balakrishna Motorola Solutions
- Ms. Sunitha Nagaraj Motorola Solutions
- Ms. Smitha Naik Motorola Solutions
- Mr. Vijayaraghavan Motorola Solutions

Faculty coordinators

- Dr. Seetharam Shettigar NMAMIT
- Prof. B. S. Shivkumara PESCE
- Prof. A C. Kiran Kumar PESCE
- Dr.K.Karnunakara SSIT
- Dr. R. Harish kumar SSIT

DIET Principals

- Smt. Sumangala DIET, Mandya
- Shri. Gopalakrishna DIET, Tumkur
- Shri. Shekar DIET, Udupi

3. INTRODUCTION TO PREMIER ENGINEERING INSTITUTIONS

P.E.S. College of Engineering, Mandya is one of the pioneer Engineering Colleges in India. Presently it is affiliated to the Visvesvaraya Technological University and is recognized by the All India Council of Technical Education, New Delhi. It is an institution functioning under the grant-in-aid scheme of Government of Karnataka. The College was established in the year 1962 by People's Education Society currently known as People's Education Trust (R), with the help of philanthropic farmers of Mandya District. The sole objective of the college was to promote Technical Education among the students of Rural Areas. The institute also offers P.G courses like M-Tech in Environmental Engineering, Computer Integrated Manufacturing, Computed Aided Design in structures and Computer science and engineering, Land and water management & MCA.

NMAM Institute of Technology was established in 1986. The college is affiliated to the Visvesvaraya Technological University, Belgaum and is recognized by the All India Council for technical Education, New Delhi. It is accredited by the National Board for Accreditation and is certified to the ISO 9001-2008 standards for quality education by KEMA, Netherlands. The institution has been granted Academic Autonomy under the Visvesvaraya Technological University from 2007-08. The Institute offers graduate programs in 7 branches of Engineering. The college also offers postgraduate programs like, Master of Technology, Master of Computer Applications and Master of Business Administration.

Sri Siddhartha Institute of Technology (SSIT) is one of the premier institutions started in the year 1979 with Civil & Mechanical Engineering by Sri Siddhartha Education

Society (SSES), Tumkur. The college has adopted "Education for Social & Economical Transformations" as its theme & all the programs are focused on this theme. SSIT has taken a leading role to uphold the entrepreneurial culture in Tumkur District. To motivate & guide young entrepreneurs, by giving consultancy & supporting services. Department of Industries & Commerce, Govt. of Karnataka has sanctioned Science & Technology Entrepreneurs Park (STEP) to the college in the year 2000 & it has been recognized as one of the best training center in the district by various Govt. agencies & Industries.

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4. INTRODUCTION TO ICT

Information and Communication Technology (ICT) happens to be the sine qua non of the present day society to catch up with the emerging trends and holds a lot of promise for posterity.

The State of Karnataka has gained world-wide recognition for being in the Vanguard of the revolution in Information and Communication Technology. It is all the more necessary for the State to produce bright scholars who are skilled in computers to meet the requirements of the present day society. Realizing this need Government of Karnataka in 2000 took a decision to introduce Information Technology in schools.

Computer Education and Computer based education was introduced in 1000 government secondary schools under the Mahithi Sindhu project, which was funded exclusively by the state. In addition, 150 government secondary schools under Revised CLASS project, 88 government secondary schools under the Eleventh Finance Commission project and 480 government secondary schools under ICT Phase-I project and 1571 schools are covered under ICT Phase-II project in the State

Vision statement, which translates:

1. "The Objective is to build the needed capabilities to those who pursue higher education and necessary skills for those who desire to enter the world of work."
2. Our children who come out of the education system should also be physically strong and sound, intellectually competent, mentally and emotionally matured, intelligent, creative innovative and exploring.

3. Every child coming out of the secondary system will be a computer literate.
4. Physical qualities should include internally sound and disease free life, physical skills of work and play – reflecting learning to know and learning to do.
5. Intellectual skills would include displaying multiple intelligence, cognition, creativity and learning to know.
6. Emotional intelligence that promotes healthy social life and learning to live together.
7. Linking oneself and work to larger social, national, global goals.

Based on the vision statement as mentioned above the Objectives of ICT projects are as follows:-

1. To establish an enabling environment to promote the usage of ICT in secondary Government schools in rural areas. To enable the rural students especially the scheduled Cast, scheduled Tribes, Backward class and minorities that to for girls to gain the complete knowledge of information technology and capacity building using the internet.
2. To enhance the learning levels of the students in Mathematics, social science, science and co-curricular activities using Information and communication Technologies.
3. To promote critical thinking and analytical skills by developing self learning. This shall transform the classroom environment from Teacher centric to Student-centric Learning.
4. To enable students to acquire skills needed for the Digital world for higher studies and gainful employment.

5. To provide effective learning environment for children through Information Communication Technology (ICT) tools
6. Capacity building of teacher for effective Teaching-Learning Process by using Information and Computer Technology tools

ICT PHASE I

The Government of India in 2005 – 06 has approved ICT@ schools under phase I scheme in 480 schools and under Phase II scheme in 1571 schools in Karnataka state. With this the coverage of computer education program in the state has gone up to 3298 government secondary schools.

ICT@ Schools project Phase –II

The Government of India (G.o.No. FNo-11-20/2007 dated 27-09-2007) in 2005 – 06 has approved ICT@ schools scheme in 1571 schools in Karnataka state.

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5. PROGRAM OBJECTIVES

Under this program, FAER intends to select ninety students from rural schools in Karnataka and provide them a one month summer internship. This program will be conducted at three premier engineering institutions. FAER intends to select about 90 students from rural schools in Karnataka (student from 9th standard or 8th standard) in association with DSERT, Govt. of Karnataka, and conduct 3 internship programs at each of selected institutions for a set of 30 students during summer 2014.

The program will be of one month duration (21 April to 16 May 2014) during the summer holidays of schools.

The main objective is to provide exposure of a good institution to rural based high school students. There are primarily three components of this program:

1. To provide a reasonable exposure to language – speaking and writing.
2. To provide exposure to some aspects of mathematics
3. To familiarize them with some gadgets and ways of living in an institution including several normal functions like eating in a mess, using libraries, living in a hostel, etc.

The students will get some exposure to laboratories, sports facilities and other campus facilities.

6. ROLE OF PREMIER ENGINEERING INSTITUTIONS

The principal of each of the identified institution is designated as the Chairman of this program and he will be responsible for conducting this program at the respective institution.

The institute will identify one faculty coordinator and 6 student coordinators (including 2 girls) who will design, own and implement this program effectively. FAER will provide suitable honorarium to the identified coordinators at the end of the program. FAER can also pay suitable honorarium to all resource persons, who play a role in this program.

The institution needs to provide appropriate accommodation in hostel and mess facilities to a set of 30 school students and 2 teachers accompanying them on a chargeable basis. The period is expected to be 4 weeks during summer (21 April - 16 May 2014). FAER will make payment towards these facilities directly to the college.

The institute needs to ensure the safety and security of the students during the time of this program. The institute also needs to ensure appropriate access to amenities like health center, sports centers and library, associated with the institute and generally available to its students.

The institute will conduct suitable inaugural and valedictory functions for this program.

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7. SELECTION OF STUDENTS

The selection of the students for this program will be done in association with the Director, Department of State Education Research and Training (DSERT), Govt. of Karnataka.

Students who are in 9th standard in rural Karnataka schools would be selected. A batch of 5-6 students will be selected from each school, based on merit. A few bright students currently pursuing 8th standard can also be considered based on the recommendation of schools / teachers. 50% of the students will be selected from general pool, another 20% from girls and rest 30% from disadvantaged groups (SC/ST).

Each batch of 30 students will also accompanied by 2 teachers (1 male and 1 female). Over all we will be requiring 3 male teachers and 3 female teachers to be associated with these 3 batches of internship students.

All selected students will get a small stipend in addition to their stay and mess expenses. They will be given a certificate of participation during the valedictory program at the completion of internship.

* ~ * ~ *

8. PROGRAM OVERVIEW

The program will consist of some lectures, a lot of discussions, interactions, home work / assignments, video / DVD viewing, sports and visits to some labs.

The student coordinators will act as a mentor for a group of five school interns.

FAER and Motorola intend to provide some voluntary support in terms of specific lectures on some topics by identified volunteers, during the course of this program.

There will be weekly feedbacks received from student interns, student coordinators and faculty coordinators. A feedback report also will be received by the college Principals at the end of the program.

At the end, all student coordinators, faculty coordinator and resource persons will get an appreciation certificate from FAER.

8.1 Important Dates:

- Induction Program – 21st April 2014
- Student Internship – 21st April - 16 May 2014
- Valedictory – 16 May 2014

8.2 Tentative Topics & schedule:

The following is a tentative sample program schedule that can be modified by each college:

1. Total no of days = 26 - 3 (Sundays) - 2 (inauguration and valedictory) = 21 days

2. Duration per day –
 - a. About three hours of lectures in the morning and 3 hours of lab sessions and activities in the afternoon.
 - b. About 150 hours of sessions inclusive of lectures, lab visits, library work etc...
 - c. Lectures are about 45 minutes maximum per session.
3. Tentative topics schedule to be considered

Sl. No	Category	Tentative Duration (in hours)
1	Mathematics	10
2	Science	8
3	English	10
4	Gadgets	10
5	Community aspects	5
6	Health Hygiene and Environment	5
7	English Reading	10
8	English Writing	10
9	English Speaking	10
10	English watching CDs/DVDs	10
11	Lab visits	3
12	Computer-Practical	10
13	Games/Sports	15
14	Drawing/Painting	5
15	Cultural-Program	10
16	Map-Reading	2
17	Library	20
18	Office-Visits	6
19	Team outing	8

4. Tentative topics overview

- Mathematics - Algebra, solution of equations, calculus (based on 10 std curriculum)
- Science - simple principles of electronics, Magnetism, electricity, mechanical etc.
- English writing/Reading/Speaking – précis, Abstracts, describe some events like a Fest (Jathre), festival, biography about great personalities in field of science, freedom fighters, famous personalities, Magsaysay award winners
- Gadgets Instruments – Thermometer, Refrigerators, Motors, Phones incl. mobiles, Printers, UPS, modems, Construction materials, Solar water heating, solar lamps, wind mills, bio gas plants etc.
- Nature – Need for Dams, Ecology of nature (Soil, water, forest, rain)
- Medical – Blood groups, functioning of various organs
- Practical – show difference between liters & Kilograms, Clinical Thermometer & Lab Thermometer
- Others - water / energy/ resources conservation, health etc.

Followed by question & answers

Slots for games and sports and cultural programs to be included

9. INDUCTION PROGRAM FOR ORGANIZERS

An induction program will be conducted for all persons involved with the program. The main objectives are, to explain the working of this program, the methodologies involved, activity planning and sensitization. This will be conducted by Motorola volunteers in the respective colleges on the day of inauguration, 21st April 2014

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10. COMMITTEE

Prof. D. K. Subramanian will be the program chairman and will be assisted by a steering committee. Steering and organizing committee members comprise of principals of the participating colleges, volunteers from FAER and Motorola solutions and few noted educationalists from Industry.

The steering committee during its meeting would recommend a program structure for the overall internship program, based on the stated objectives. However, the program at each institute will be designed and delivered by the identified coordinators to suit the overall framework identified by the steering committee.

The organizing committee will support the steering committee to ensure smooth operation of the program.

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11. ROLES & RESPONSIBILITIES

11.1 Faculty coordinator

The Faculty coordinator with the support of 6 student coordinators will design, own and implement this program effectively will also ensure the following:

Program implementation

- Availability of faculty for the various classes
- Availability of lab instructors
- Ensuring the conduct of classes as per syllabus
- Ensuring the conduct of classes as per schedule
- Aware of the student interns at all times during the program.

Facilitating

- Stay and learning & safety of the student interns
- Stay of the accompanying teachers
- Handling any support requirements

11.2 Student coordinator

The student coordinators in addition to increasing the comfort levels and mentoring of the interns will also ensure the following

- Guiding the student interns in their stay and learning
- Mentoring the student interns to follow the safety and security procedures of the hosting institute

- Mentoring the student interns in utilizing the amenities of the institutes
- Being available for any clarification / support / emergency requirements of the student interns
- Assist them in labs
- Support them in learning language and communications skills.
- To ensure that the student interns stick to their class schedules.

- To never to leave the premises without appropriate permission and accompanying teachers or student coordinators
- To get back to class rooms and hostel rooms as per said timelines
- To intimate either the accompanying teachers or student coordinators in case of any sickness or difficulty at any time during the internship
- To never to indulge in any form of activity which violates the rules and regulations of the institute.

11.3 Care Taker / Hostel Wardens for Student Interns

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The accompanying care taker in addition to monitor the overall well being of their student interns will have to ensure the following:

- To engage them and help the student interns in case of any home sickness
- To ensure that the student interns stick to the rules and regulations of the hostel faculty
- To ensure that they are aware of their student interns at all times during the program
- To facilitate communication of the students, if required, with their parents/guardians

11.4 Student Interns

The Student interns in addition to ensuring 100% attendance have to ensure the following:

- To always inform their accompanying teachers about their whereabouts

12. CONTACT LIST

DIET Principals	Title	Phone
Smt. Sumangala	Principal, DIET - Mandya	91-9448999376
Shri. Gopalakrishna	Principal, DIET - Tumkur	91-9448999380
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Faculty Coordinators	Title	Phone
Dr. Seetharam Shettigar	Faculty Co-ordinator, NMAMIT	91-9448382169
Prof. B. S. Shivkumara	Faculty Co-ordinator, PESCE	91-9448514205
Prof. A. C. Kiran Kumar	Faculty Co-ordinator, PESCE	91-9448643865
Dr. K. Karnunakara	Faculty Co-ordinator, SSIT	91-9449623303
Dr. Harish kumar	Faculty Co-ordinator, SSIT	91-9739030655
Organizing committee	Title	Phone
Mr. T. K. Ramesh	Integra Micro Systems	91-9845694194
Dr. S. G. S. Swamy	KSCST	91-9448515976
Mr. K. N. Venkatesh	KSCST	91-9448906242
Mr. Krishna Bhagavan	Motorola Solutions	91-9880105102
Ms. Indu Srinivasachar	Motorola Solutions	91-9844054701
Ms. Sabitha Balakrishna	Motorola Solutions	91-9845522300
Ms. Smitha Naik	Motorola Solutions	9844054701

Volunteers from Motorola Solutions

For NMAMIT Nitte	For PES Mandya	For SSIT Tumkur
Indu Srinivasachar	Smitha Naik	Sabitha Balakrishna
Shekar Muniven	Vijayaraghavan C S	Sunitha Nagaraj
Preeti Naik	K A Dinesh Kumar	R K Yadhunandana
K N Ramakrishna	Rashmi Narayan	Bibash Saha
S R Shashi Kumar	Anusha Mehta	Manoj Kumar Gupta
Kunal Khaire	R Gayathri	Anil Vernekar
Krishna Ranjan	Mahesh Pai	T R Narasimha Swamy
	Ajosh Anandan	Mallika Shetty
	Jacob Jacob	Raghunandan Nagaraja Rao
	Arun Subramanyam	Somashekar Swamy N
	Padmapriya Ramanujan	Swetha Lingutla - Crimson Logics
	Krishna Bhagavan	Satish Chowdhury
		Shiv Shankar Maurya

Staff / Student Coordinators

NMAMIT - Nitte	PESCE – Mandya	SSIT - Tumkur
Dr. Narashimha Marakala - Professor	Arjun Sridhar	Nitesh
Mrs. Umasankaran (Associate Director) Student Affairs	Nithish M.D	Raghavendra
Mr. Raghavendra Bairy - Lecturer	Navya Rao	Supreetha
Mr. Vishwanath ME - Lecturer	Damini B.J	Bhavani
Sharamada - Student Volunteer	Nisarga R	Kalpana
Shruthi M.N - Student Volunteer	Santhosh kumar	Divya P
Khyati Savakia - Student Volunteer	Vijaya Kumar	
Shwetha Kumari V - Student Volunteer	Radhika	
	Sharvari	
	Chethan	
	Sitara	
	Manu B.R	

13. ABBREVIATIONS

- DIET - District Institute of Educational and Training
- DSERT - Department of State Education Research and Training
- FAER - Foundation for Advancement of Education and Research
- ICT - Information and Communication Technology
- NMAMIT - Nitte Mahalinga Adyanthaya Memorial Institute of Technology
- PESCE - People's Education Society College of Engineering
- SSIT - Sri Siddhartha Institute of Technology

*Let us together make this summer an
Educative, Enjoyable & Inspiring experience
for the student interns*