



ANURAG Engineering College

(Approved by AICTE, New Delhi, Affiliated to JNTU,Hyd, TEQIP Granted)
Ananthagiri (V & M), Suryapet (Dt)

Date: 06/06/2018

CIRCULAR

All the faculty members are here by informed that "A Three Day Faculty Development Program" will be held from 07th to 09th June 2018. All the faculty members should attend and make it a grand success.

S.No	Date & Time	Programme Name	Resource person
1	07.06.2018 10:00 – 16:30	Improving Teaching Effectiveness	Dr. A P Natarajan
2	08.06.2018 10:00 – 16:30	Entrepreneurship Development & IPR	Ms Apoorva Anand Conjeevaram
3	09.06.2018 10:00 – 16:30	Sponsored Research Programmes	Dr. S. V. Ranganayakulu


Venue: Auditorium (Block-E)

Reporting Time: 9:45 AM

Copy to

1. Secretary & Correspondent File
2. All HoD's
3. Circulate among the faculty members


PRINCIPAL


Principal
Anurag Engineering College
Ananthagiri (V&M), Kodad,
Suryapet (Dt.), Telangana-508206

① M.E - Dulo
6/6/18

② ~~the~~ allin

③ MBA Q-2
6/6/18

④ CE C. Maddy

⑤ DIPLOMA - Q.
6/6/18

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6/6/18

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⑦ ASPE ECE.



ANURAG Engineering College

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An Autonomous Institution

Ananthagiri(V&M), Suryapet(Dist.),Telangana.

PROGRAMME SHEET

Title of the Programme	:	Improving Teaching Effectiveness
Date	:	07th June 2018, Thursday
Focus	:	<ul style="list-style-type: none">• Attributes of Teacher, Effective Teaching, Classroom Management and pedagogy• Leadership and teambuilding in Technical Institutions.• Emotional Intelligence and Interpersonal Skills.
Programme Timmings		
Session 1	:	09:45 PM to 11:15 PM
Break	:	11:15 PM to 11:30 PM
Session 2	:	11:30 PM to 01:00 PM
Lunch	:	01:00 PM to 01:30 PM
Session 3	:	01:30 PM to 03:00 PM
Break	:	03:00 PM to 03:15 PM
Session 4	:	03:15 PM to 04:45 PM


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ATTITUDE BAROMETER

Assess your current attitude by reading each statement and circling the number that you feel is an accurate description of your current attitude.

S.No	Statement	High positive					Low Negative				
1.	My guess is that my supervisor would rate my current attitude as a:	10	9	8	7	6	5	4	3	2	1
2.	My Staff (or the people I work closest with) would probably rate my current Attitude as a :	10	9	8	7	6	5	4	3	2	1
3.	My family would probably rate my current Attitude as a:	10	9	8	7	6	5	4	3	2	1
4.	Honestly, I would rate my current attitude as a:	10	9	8	7	6	5	4	3	2	1
5.	In dealing with others, I believe my effectiveness would rate a:	10	9	8	7	6	5	4	3	2	1
6.	If a meter could gauge my sense of humour, I believe it would read close to a:	10	9	8	7	6	5	4	3	2	1
7.	My recent disposition --- the patience and sensitivity I show to others -- deserves a rating of:	10	9	8	7	6	5	4	3	2	1
8.	When it comes to not allowing little things to bother me, I've recently earned a:	10	9	8	7	6	5	4	3	2	1
9.	Based upon the number of compliments I've received lately, I deserve a:	10	9	8	7	6	5	4	3	2	1
10.	I would rate my enthusiasm toward my job and my life during the past few weeks as a:	10	9	8	7	6	5	4	3	2	1


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VICTORIA TRAINING FOUNDATION


SOME ASSUMPTIONS FOR TEACHERS

Every teacher or trainer, consciously or unconsciously, works on certain assumptions. Since our assumptions are so influential and far-reaching in their effects, it is good to know what they are. What are your assumptions as a teacher? Take a look at the assumptions listed below and indicate whether you agree or disagree. 1=strongly disagree; 2=Disagree; 3=Undecided; 4=Agree; 5=Strongly Agree

S.No	Assumptions	Individual Choice	Group choice
1.	Children are by nature smart, energetic, curious, and eager to learn and good at learning.		
2.	Knowledge is the accumulation of brick upon brick of content and information.		
3.	Children learn best when they are happy, active, involved and interested in what they are doing.		
4.	Learning means teacher, classroom, and textbook		
5.	Children learn least or not at all when they are bored, threatened, humiliated, frightened.		
6.	Most learning is a result of teaching.		
7.	Any subject can be taught effectively in some intellectually honest form to any child at any stage of development.		
8.	Learning bears a close relationship to the frequency with which students sit in front of an Instructor.		
9.	A new way of acting leads to a new way of thinking more often than a new way of thinking leads to a new way of acting.		
10.	Creative scientists develop from passive learners.		
11.	Tests reveal more about teachers than about students.		
12.	Teaching is telling.		
13.	What we do in teaching depends on what we think people are like and what they can become.		
14.	Playing and learning are two separate and opposed activities.		
15.	To enable the student to accept him or herself as valuable, competent, and able to manage and affect ones own life: this should be the core objective of all education.		
16.	Learning and doing are separate and apposed activities.		
17.	In the future, the capacity to face the new appropriately, will be more important than the ability to know and repeat the old.		
18.	What is presented in the lecture is what the student learns.		

Part-2

1. I was going to the market and came across a family consisting of a father, mother, two sons and three daughters. How many male members are going to the market?
2. You have only two jugs of 5 litres and 3 lts. You want to take exactly 4 lts of water from a pond. How?
3. A cat jumps from 2 feet wall and breaks two legs. How many legs it breaks if it jumps from 4 feet wall?
4. On 7th august 1990, a man found a rare thing in his digital watch at 56 seconds 12.34. What is it?
5. Some months have 31 days , others have 30 days , How many have 28 days?
6. If there are 6 apples and you take away 4 , How many do you have?
7. If Mr. Smith's Peacock lays an egg in Mr. Jones' yard , Who owns the egg?
8. How much dirt is there in a hole 3 feet deep , 6 feet long and 4 feet wide?
- 9 . Two brothers born in same year, same month , same date, same hour with only two minutes time difference between them . They both have same father and mother.(means they are real brothers). But they say they are not twins. Why?
10. An electric train is moving north at 100 km per hour and the wind is blowing to the west at 10 km per hour. Which way does the smoke blow?


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Puzzles and Brain Teasers

Part-1

1. Man

Board

2. Stand

|

3. r/e/a/d/i/n/g

4 cycle

Cycle

Cycle

5. ground

6. He is x himself

Feet feet feet feet feet feet

7. ecnalg

8. THINK

Anurag Engineering College

FACULTY DEVELOPMENT PROGRAMME 07.06.2018

Improving Teaching Effectiveness

S.No	Name of the Faculty	BRANCH	FN	AN
1	Dr.M.V.Siva Prasad	CSE		
2	Dr.H.Parveen Begam	CSE		
3	Dr.M.Murugesan	CSE		
4	G.Srinivasa Rao	CSE		
5	Y.V.R. Naga Pawan	CSE	Examination Duty	
6	G.V.S.CH.S.L.V. Prasad	CSE		
7	P.Gurulingam	CSE		
8	P.Sandeep Reddy	CSE		
9	CH.Krishna Prasad	CSE		
10	J.Nagaraju	CSE		
11	Y.Laxmi Prasanna	CSE	Examination Duty	
12	M.Shailaja	CSE		
13	P. Niranjan Kumar	CSE		
14	K.Vijay Kumar	CSE	deputation	
15	K. Naresh Kumar	CSE		
16	Y.Bharath Bhushan	CSE	deputation	
17	T.Aruna	CSE		
18	CH.D.V.Girish	CSE	Eng Examination Duty	
19	P.Vishnu Vardhan	CSE		
20	G.Subhadra	CSE	Examination duty	
21	N.Mounika	CSE		
22	G.L.N.V. Kartheek	CSE	Imip lab	
23	K.Krishna Reddy	CSE		
24	N.Mahesh Babu	CSE	Imip lab	
25	G.Ramadevi	CSE		
26	V.Sujitha	CSE		
27	S.Rajeswari	CSE		


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Suryanet (Dt.), Telangana-508201

28	CH.Venkata Navi	CSE	Chenabala Navi	Chenabala Navi
29	B.Lalithabai	CSE	Bany	Bany
30	V.Jaswanthi	CSE	Jaswanthi	Jaswanthi
31	N.Siva Kumar	CSE		
32	S.Saritha	CSE	ESR	ESR
33	P.Mahesh Goud	CSE	P.Mahesh	P.Mahesh
34	CH.Anjaiah	CSE	Invy	Invy
35	P.Nikitha	CSE	Ni	Ni
36	MD.Ayub Khan	CSE	Examination duty	
37	K.Upender Rao	CSE	Examination duty	
38	M.Navya	CSE		lab exam
39	A.Naresh Kumar	CSE	reputation	reputation
40	J.Vijayasree	CSE	P.Vijayasree	P.Vijayasree
41	Dr.V.Srinivasa Rao	ECE	Examination duty	
42	Dr. N. Ravi Kumar	ECE		
43	Dr. B.B.M.Krishna Kanth	ECE		
44	Dr.B.Rajan	ECE	Examination duty	
45	Dr.G.Kiran Kumar	ECE	Examination duty	
46	M. Basha	ECE	I. Duty	mess
47	T.Sreedevi	ECE	Bri	Bri
48	G.Shobha	ECE	Shobha	Shobha
49	S.Uday Kumar	ECE	Uday	Uday
50	V.Guruvaiah	ECE	V.Guru	V.Guru
51	Y.Venkateswarlu	ECE	Y.Ven	Y.Ven
52	N.Harika	ECE	N. Harika	N. Harika
53	L.Hari Prasad	ECE	H.M.M	H.M.M
54	R.Bhavya	ECE	R.Bh	R.Bh
55	R.Priyanka	ECE	R.Pri	R.Pri
56	P.Kowmudi	ECE	P.Kow	P.Kow
57	V.David	ECE	V.David	V.David
58	MD.Fareed Ahamad	ECE	Examination duty	

59	SK.Saida Babu	ECE	SK	SK
60	D.Shirisha	ECE	Shirisha	
61	K.Koti Reddy	ECE	(KR)	(KR)
62	V.Kalyani	ECE	Kalyani	Kalyani
63	V.Leelashyam	ECE	Leelashyam	Leelashyam
64	P.Laxmi	ECE	Laxmi	
65	J.Usha	ECE	Usha	Usha
66	A.Sujitha	ECE	Ajay	
67	M.Venkaatratnam	ECE	Ratnam	Ratnam
68	J.Sujitha	ECE		
69	D.Rjeev Naik	ECE	Investigation	
70	P.Rajesh Naik	ECE	Lab Examination	
71	N.Venkateswarlu	ECE	Examination	
72	K.Manasa	ECE	(MK)	(MK)
73	G.Mahesh	ECE	Mahesh	Mahesh
74	V.Varalaxmi	ECE	Varalaxmi	Varalaxmi
75	K.Srinadh	ECE	K. Srinadh	K. Srinadh
76	N.Varoodhini	ECE	Varodhini	Varodhini
77	Dr.V.Jayaprakash Narayanan	EEE		
78	Dr.K.Rajangam	EEE	Rajangam	Rajangam
79	S. Chandra Sekar	EEE	Chandra Sekar	Chandra Sekar
80	J.Srinivasa Rao	EEE	Srinivasa Rao	Srinivasa Rao
81	T.Raghu	EEE	Raghu	Raghu
82	G.Satyanarayana	EEE	G. Satyanarayana	G. Satyanarayana
83	S.Yasoda Krishna	EEE	Yasoda Krishna	Yasoda Krishna
84	M.Srinu	EEE	Srinu	Srinu
85	B.Sreenu	EEE	Sreenu	Sreenu
86	K.Shiva Shanker	EEE	Shankar	Shankar
87	J.Suman	EEE	Suman	Suman
88	V.Achi Reddy	EEE	Achi Reddy	Achi Reddy
89	A.Suresh	EEE	Suresh	Suresh


90	SK.Abdul Pasha	EEE	<i>Am</i>	<i>Am</i>
91	N. Shankar	EEE	<i>Sh</i>	<i>Sh</i>
92	K. Mahesh	EEE	<i>Mahesh</i>	<i>Mahesh</i>
93	G. Rajesh	EEE	<i>Rajesh</i>	<i>Rajesh</i>
94	K. Sravanthi	EEE	<i>Sravanthi</i>	<i>Sravanthi</i>
95	B.Ramakrishna	EEE	<i>Ramakrishna</i>	<i>Ramakrishna</i>
96	D.Upendar	EEE	<i>D. Upendar</i>	<i>D. Upendar</i>
97	B.Srinu	EEE	<i>B. Srinu</i>	<i>B. Srinu</i>
98	L.Ashok	EEE	<i>Ashok</i>	<i>Ashok</i>
99	D.Firoz Kumar	EEE	<i>Firoz Kumar</i>	<i>Firoz Kumar</i>
100	S.Vijaya Kumar	EEE	<i>Vijaya Kumar</i>	<i>Vijaya Kumar</i>
101	P.Paramesh	EEE	<i>P. Paramesh</i>	<i>P. Paramesh</i>
102	K.Rajashekar	EEE	<i>Rajashekar</i>	<i>Rajashekar</i>
103	N.Kiran Kumar	EEE	<i>Kiran Kumar</i>	<i>Kiran Kumar</i>
104	MD.Khaja Nizamuddin	EEE		
105	N.L.Santhi Nirmala	EEE	<i>L. Santhi</i>	<i>L. Santhi</i>
106	K.Rajani	EEE	<i>Rajani</i>	<i>Rajani</i>
107	Dr.R.Ganapati	MECH	<i>Ganapati</i>	<i>Ganapati</i>
108	K.Veeranjaneyulu	MECH	<i>Veeranjaneyulu</i>	<i>Veeranjaneyulu</i>
109	B.Biksham	MECH	<i>Biksham</i>	<i>Biksham</i>
110	L.Ramesh	MECH	<i>Ramesh</i>	<i>Ramesh</i>
111	P.Chitti Babu	MECH	Examination duty	Examination duty
112	Y.Rajesh Kanna	MECH	<i>Rajesh Kanna</i>	<i>Rajesh Kanna</i>
113	A.Suresh	MECH	<i>Suresh</i>	<i>Suresh</i>
114	E.Sadanandam	MECH	Examination duty	Examination duty
115	K.Bulli Babu	MECH	Examination duty	Examination duty
116	G.CH.Ganga Rao	MECH	Examination duty	Examination duty
117	K.Kasinadham	MECH	<i>Kasinadham</i>	<i>Kasinadham</i>
118	J.Ashok	MECH	<i>Ashok</i>	<i>Ashok</i>
119	R.Laxman	MECH	<i>R. Laxman</i>	<i>R. Laxman</i>
120	K.Sudhakar	MECH	<i>Sudhakar</i>	<i>Sudhakar</i>


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121	L.Vemana	MECH		
122	M.Ravi Kumar	MECH		ISMB class work
123	CH.Ramyasree	MECH		
124	J.Saidaiiah	MECH		
125	B.Devender	MECH		
126	N.Naveen	MECH		
127	D.Sreedhar	MECH		
128	S.Champulal	MECH		
129	E.Ramesh	MECH		
130	Dr.M.S.Siva Kumar	CIVIL	CL	CL
131	C.Manikanta Reddy	CIVIL		
132	S.Kalyani	CIVIL		
133	M.Ashok	CIVIL		
134	D.Sravanthi	CIVIL		
135	G.Narender	CIVIL		
136	S.Naresh	CIVIL	CL	CL
137	D.V.N.V:Lakshmi Alekhya	CIVIL	CL	CL
138	CH.Babu Rao	CIVIL		ISMB class work
139	P.Sruthi	CIVIL		
140	P.Guruswamy	CIVIL		
141	N.Murali Krishna	CIVIL		
142	G.Siva Prasad	CIVIL		
143	P.Ananda Rao	CIVIL		ISMB class work
144	B.Rambabu	CIVIL		
145	A.Shiva Krishna	CIVIL		
146	SK.Rahaman	CIVIL		
147	M.Nagendra	CIVIL		
148	D.Satish Kumar	CIVIL		
149	SK.Shareef	CIVIL		
150	J.Mounika	CIVIL		
151	S.Papa Rao	CIVIL	CL	CL

152	Sunny	CIVIL	ll. Sunny	ll. Sunny
153	L.Mahesh	MINING	mahesh	mahesh
154	M.Rajkumar	MINING	rajku	rajku
155	K.Rakesh Kumar	MINING	Rakesh	Rakesh
156	G.Manohar	MINING		
157	V.Rajendra Prasad	MINING	Vijend	Vijendnd
158	SK.Thofiq	MINING	Thofiq	Thofiq
159	G.Prem Kumar	MINING	GPK	GPK
160	Dr.A.Srinivasu	MBA	A S2	A S2
161	M.Shilpa	MBA		Shilpa
162	V.Sarada	MBA		Sarada
163	N.Anitha	MBA		Anitha
164	CH.Ramesh	MBA	Ramesh	Ramesh
165	G.Varma	MBA		Varma
166	D.Venkanna	MBA		
167	G. Venkata Krishna	MATHS	K	K
168	T. Nagaraju	MATHS	Nagaraju	Nagaraju
169	N.Koti Reddy	MATHS	Reddy	Reddy
170	Ch.Bhaskar Reddy	MATHS	Bhaskar	Bhaskar
171	V.Kavitha	MATHS	Kavitha	Kavitha
172	Dr.P.Jyothi	MATHS	J	J
173	R.Edukondalu	MATHS	REK	REK
174	NCH Sridhar	MATHS	NCH	NCH
175	P.Ramakrishna	MATHS	P	P
176	D.Pandu Ranga Rao	ENGLISH	D. Pand	D. Pand
177	G.Venkateswarlu	ENGLISH	Examination duty	
178	M.Suvarna	ENGLISH	Examination duty	
179	SK.Fayazuddin	ENGLISH		
180	K.Lakshmaiah	ENGLISH	Lakshmaiah	Lakshmaiah
181	J.Poorna Kumar	ENGLISH	Examination duty	
182	Dr.K.Ramesh	ENGLISH	Examination duty	

183	Dr.SK.Ummar Pasha	PHYSICS	<i>Uy</i>	<i>Uy</i>
184	M.Narasimha Rao	PHYSICS	<i>Uy</i>	<i>Uy</i>
185	Y.V.N.Damodara Rao	PHYSICS	<i>Uy</i>	<i>Uy</i>
186	V.Lajapathi Rao	PHYSICS	<i>Uy</i>	<i>Uy</i>
187	Y.Sri Devi	PHYSICS	<i>Uy</i>	<i>Uy</i>
188	CH.Srinivasa Reddy	PHYSICS		
189	Dr.D.Hari Prasad	CHEMISTRY	<i>Uy</i>	<i>Uy</i>
190	K.Srinivas	CHEMISTRY	Examination duty	Examination duty
191	Dr.S.Pulla Reddy	CHEMISTRY	Examination duty	Examination duty
192	H. Venkateshwara Rao	CHEMISTRY		
193	D.Chandrashekar Rao	CHEMISTRY	<i>Uy</i>	<i>Uy</i>
194	K.Swathi	CHEMISTRY	<i>Uy</i>	<i>Uy</i>
195	Ch.Vidya Sagar	H&S	Examination duty	Examination duty
196	A.Chaitanya	H&S	Examination duty	Examination duty
197	AVLV Prasada Rao	H&S		
198	S.Dharma Bixam	H&S	<i>Uy</i>	<i>Uy</i>
199	P.Kanakaiah	H&S	<i>Uy</i>	<i>Uy</i>


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07-06-18



Nata Rajan addressing the faculty



Principal
Anurag Engineering College
. Ananthagiri (V&M), Kodad,
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Date: 06/06/2018

CIRCULAR

All the faculty members are here by informed that "A Three Day Faculty Development Program" will be held from 07th to 09th June 2018. All the faculty members should attend and make it a grand success.

S.No	Date & Time	Programme Name	Resource person
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2	08.06.2018 10:00 – 16:30	Entrepreneurship Development & IPR	Ms Apoorva Anand Conjeevaram
3	09.06.2018 10:00 – 16:30	Sponsored Research Programmes	Dr. S. V. Ranganayakulu

Venue: Auditorium (Block-E)


Reporting Time: 9:45 AM

Copy to

1. Secretary & Correspondent File
2. All HoD's
3. Circulate among the faculty members



PRINCIPAL



Principal
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Ananthagiri(V&M), Suryapet(Dist.),Telangana.

PROGRAMME SHEET

Title of the Programme	:	Entrepreneurship Development & IPR
Date	:	08th June 2018, Friday
Focus	:	<ul style="list-style-type: none">• Attributes of Teacher, Effective Teaching, Classroom Management and pedagogy• Leadership and teambuilding in Technical Institutions and Pedagogy• Emotional Intelligence and Interpersonal Skills
Programme Timings		
Session 1	:	09:45 PM to 11:15 PM
Break	:	11:15 PM to 11:30 PM
Session 2	:	11:30 PM to 01:00 PM
Lunch	:	01:00 PM to 01:30 PM
Session 3	:	01:30 PM to 03:00 PM
Break	:	03:00 PM to 03:15 PM
Session 4	:	03:15 PM to 04:45 PM


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Anurag Engineering College

FACULTY DEVELOPMENT PROGRAMME 08.06.2018


Entrepreneurship Development & IPR

S.No	Name of the Faculty	BRANCH	FN	AN
1	Dr.M.V.Siva Prasad	CSE		
2	Dr.H.Parveen Begam	CSE	H.P.O	H.P.O
3	Dr.M.Murugesan	CSE	M/S	M/S
4	G.Srinivasa Rao	CSE	GR	GR
5	Y.V.R. Naga Pawan	CSE	Y.V.R.	Y.V.R.
6	G.V.S.CH.S.L.V. Prasad	CSE	G.V.S.	G.V.S.
7	P.Gurulingam	CSE	P.G.	P.G.
8	P.Sandeep Reddy	CSE	P.S.	P.S.
9	CH.Krishna Prasad	CSE	CH.K.	CH.K.
10	J.Nagaraju	CSE	J.N.	J.N.
11	Y.Laxmi Prasanna	CSE	Y.L.	Y.L.
12	M.Shailaja	CSE	M.S.	M.S.
13	P. Niranjan Kumar	CSE	P.N.K.	P.N.K.
14	K.Vijay Kumar	CSE	K.V.K.	K.V.K.
15	K. Naresh Kumar	CSE	K.N.K.	K.N.K.
16	Y.Bharath Bhushan	CSE	Y.B.B.	Y.B.B.
17	T.Aruna	CSE	T.A.	T.A.
18	CH.D.V.Girish	CSE	CH.D.V.G.	CH.D.V.G.
19	P.Vishnu Vardhan	CSE		
20	G.Subhadra	CSE	G.S.	G.S.
21	N.Mounika	CSE	N.M.	N.M.
22	G.L.N.V. Kartheek	CSE	G.L.N.V.K.	G.L.N.V.K.
23	K.Krishna Reddy	CSE	K.K.R.	K.K.R.
24	N.Mahesh Babu	CSE	N.M.B.	N.M.B.
25	G.Ramadevi	CSE	G.R.	G.R. - class work
26	V.Sujitha	CSE	V.S.	V.S.
27	S.Rajeswari	CSE	S.R.	S.R.


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28	CH.Venkata Navi	CSE	Ch Venkata Navi	Ch Venkata Navi
29	B.Lalithabai	CSE	B Lalithabai	B Lalithabai
30	V.Jaswanthi	CSE	OUCEET Invisi Water conductivity	Jaswanthi
31	N.Siva Kumar	CSE		
32	S.Saritha	CSE	S Saritha	S Saritha
33	P.Mahesh Goud	CSE	P Mahesh Goud	P Mahesh Goud
34	CH.Anjaiah	CSE	CH Anjaiah	CH Anjaiah
35	P.Nikitha	CSE	P Nikitha	P Nikitha
36	MD.Ayub Khan	CSE	MD Ayub Khan	MD Ayub Khan
37	K.Upender Rao	CSE	K Upender Rao	K Upender Rao
38	M.Navaya	CSE	M Navaya	M Navaya
39	A.Naresh Kumar	CSE	deputatation A Naresh Kumar	deputatation A Naresh Kumar
40	J.Vijayasree	CSE	J Vijayasree	J Vijayasree
41	Dr.V.Srinivasa Rao	ECE	Dr V Srinivasa Rao	Dr V Srinivasa Rao
42	Dr. N. Ravi Kumar	ECE		
43	Dr. B.B.M.Krishna Kanth	ECE		
44	Dr.B.Rajan	ECE		
45	Dr.G.Kiran Kumar	ECE	Dr G Kiran Kumar	Dr G Kiran Kumar
46	M. Basha	ECE	M Basha	M Basha
47	T.Sreedevi	ECE	T Sreedevi	T Sreedevi
48	G.Shobha	ECE	G Shobha	G Shobha
49	S.Uday Kumar	ECE	S Uday Kumar	S Uday Kumar
50	V.Guruvaiah	ECE	V Guruvaiah	V Guruvaiah
51	Y.Venkateswarlu	ECE	Y Venkateswarlu	Y Venkateswarlu
52	N.Harika	ECE	N Harika	N Harika
53	L.Hari Prasad	ECE	L Hari Prasad	L Hari Prasad
54	R.Bhavya	ECE	R Bhavya	R Bhavya
55	R.Priyanka	ECE	R Priyanka	R Priyanka
56	P.Kowmudi	ECE	P Kowmudi	P Kowmudi
57	V.David	ECE	V David	V David
58	MD.Fareed Ahamad	ECE	MD Fareed Ahamad	MD Fareed Ahamad



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59	SK.Saida Babu	ECE	SK	SK
60	D.Shirisha	ECE	Shirisha	Shirisha
61	K.Koti Reddy	ECE	(KR)	(KR)
62	V.Kalyani	ECE	Kalyani	Kalyani
63	V.Leelashyam	ECE	Leelashyam	Leelashyam
64	P.Laxmi	ECE	Laxmi	Laxmi
65	J.Usha	ECE	Usha	Usha
66	A.Sujitha	ECE		
67	M.Venkaatratnam	ECE	Rama	Rama
68	J.Sujitha	ECE	Sujitha	Sujitha
69	D.Rjeev Naik	ECE	inivitat inivitat	
70	P.Rajesh Naik	ECE	+	+
71	N.Venkateswarlu	ECE	Exercis notum suly	
72	K.Manasa	ECE	(MK)	(MK)
73	G.Mahesh	ECE	Mahesh	Mahesh
74	V.Varalaxmi	ECE	Varalaxmi	Varalaxmi
75	K.Srinadh	ECE	K.Srinadh	K.Srinadh
76	N.Varoodhini	ECE	Varoodhini	Varoodhini
77	Dr.V.Jayaprakash Narayanan	EEE		
78	Dr.K.Rajangam	EEE	Rajangam	Rajangam
79	S. Chandra Sekar	EEE	S.Chandra Sekar	S.Chandra Sekar
80	J.Srinivasa Rao	EEE	J.Srinivasa Rao	J.Srinivasa Rao
81	T.Raghu	EEE	T.Raghu	T.Raghu
82	G.Satyanarayana	EEE	G.Satyanarayana	G.Satyanarayana
83	S.Yasoda Krishna	EEE	S.Yasoda Krishna	S.Yasoda Krishna
84	M.Srinu	EEE	M.Srinu	M.Srinu
85	B.Sreenu	EEE	B.Sreenu	B.Sreenu
86	K.Shiva Shanker	EEE	Shankar	Shankar
87	J.Suman	EEE	Suman	Suman
88	V.Achi Reddy	EEE	Achi Reddy	Achi Reddy
89	A.Suresh	EEE	Suresh	Suresh

90	SK.Abdul Pasha	EEE	<i>Abul</i>	<i>Abul</i>
91	N. Shankar	EEE	<i>Ch</i>	<i>Ch</i>
92	K. Mahesh	EEE	<i>mahe</i>	<i>mahe</i>
93	G. Rajesh	EEE	<i>Rajesh</i>	
94	K. Sravanthi	EEE	<i>Sravanthi</i>	<i>Sravanthi</i>
95	B.Ramakrishna	EEE	<i>Ramakrishna</i>	<i>Ramakrishna</i>
96	D.Upendar	EEE	<i>D. Upendar</i>	<i>D. Upendar</i>
97	B.Srinu	EEE	<i>B. Srinu</i>	<i>B. Srinu</i>
98	L.Ashok	EEE	<i>Ashok</i>	<i>Ashok</i>
99	D.Firoz Kumar	EEE	<i>Firoz Kumar</i>	<i>Firoz Kumar</i>
100	S.Vijaya Kumar	EEE		
101	P.Paramesh	EEE	<i>P. Paramesh</i>	<i>P. Paramesh</i>
102	K.Rajashekar	EEE	<i>Rajashekar</i>	<i>Rajashekar</i>
103	N.Kiran Kumar	EEE	<i>Kiran Kumar</i>	<i>Kiran Kumar</i>
104	MD.Khaja Nizamuddin	EEE		
105	N.L.Santhi Nirmala	EEE	<i>N. Santhi</i>	<i>N. Santhi</i>
106	K.Rajani	EEE	<i>Rajani</i>	<i>Rajani</i>
107	Dr.R.Ganapati	MECH	<i>Ganapati</i>	<i>Ganapati</i>
108	K.Veeranjaneyulu	MECH	<i>Veeranjaneyulu</i>	<i>Veeranjaneyulu</i>
109	B.Biksham	MECH	<i>Biksham</i>	<i>Biksham</i>
110	L.Ramesh	MECH	<i>Ramesh</i>	<i>Ramesh</i>
111	P.Chitti Babu	MECH	<i>P. Chitti Babu</i>	<i>P. Chitti Babu</i>
112	Y.Rajesh Kanna	MECH	<i>Rajesh Kanna</i>	<i>Rajesh Kanna</i>
113	A.Suresh	MECH	<i>Suresh</i>	<i>Suresh</i>
114	E.Sadanandam	MECH		
115	K.Bulli Babu	MECH	<i>Bulli Babu</i>	<i>Bulli Babu</i>
116	G.CH.Ganga Rao	MECH	<i>Ganga Rao</i>	<i>Ganga Rao</i>
117	K.Kasinadham	MECH	<i>Kasinadham</i>	<i>Kasinadham</i>
118	J.Ashok	MECH	<i>Ashok</i>	<i>Ashok</i>
119	R.Laxman	MECH	<i>R. Laxman</i>	<i>R. Laxman</i>
120	K.Sudhakar	MECH	<i>Sudhakar</i>	<i>Sudhakar</i>

121	L.Vemana	MECH		
122	M.Ravi Kumar	MECH		
123	CH.Ramyasree	MECH		SOME class work
124	J.Saidaiah	MECH		
125	B.Devender	MECH		SOME class work
126	N.Naveen	MECH		
127	D.Sreedhar	MECH		SOME class work
128	S.Champulal	MECH		
129	E.Ramesh	MECH		
130	Dr.M.S.Siva Kumar	CIVIL	CL	CL
131	C.Manikanta Reddy	CIVIL		
132	S.Kalyani	CIVIL		
133	M.Ashok	CIVIL		SOME class work
134	D.Sravanthi	CIVIL		
135	G.Narender	CIVIL		
136	S.Naresh	CIVIL	CL	CL
137	D.V.N.V.Lakshmi Alekhya	CIVIL	CL	CL
138	CH.Babu Rao	CIVIL		SOME class work
139	P.Sruthi	CIVIL		
140	P.Guruswamy	CIVIL		
141	N.Murali Krishna	CIVIL		SOME class work
142	G.Siva Prasad	CIVIL		
143	P.Ananda Rao	CIVIL		SOME class work
144	B.Rambabu	CIVIL		
145	A.Shiva Krishna	CIVIL		
146	SK.Rahaman	CIVIL		
147	M.Nagendra	CIVIL		
148	D.Satish Kumar	CIVIL		
149	SK.Shareef	CIVIL		
150	J.Mounika	CIVIL		
151	S.Papa Rao	CIVIL		

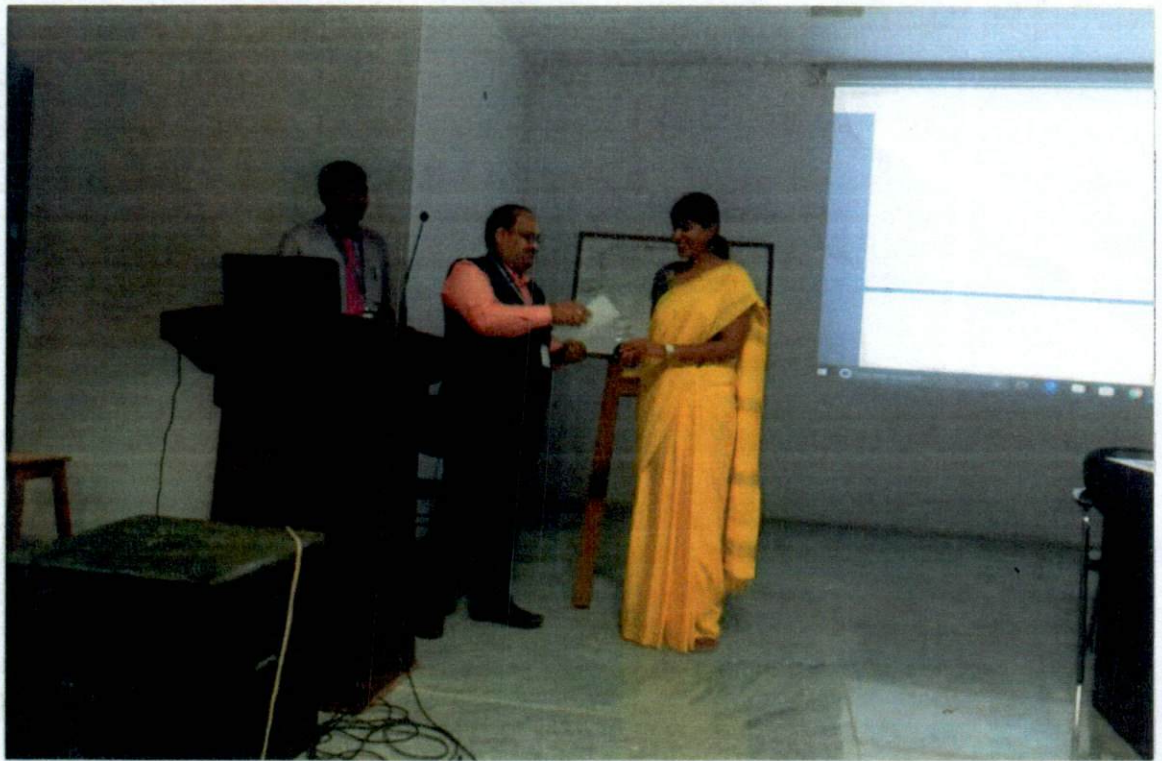
152	Sunny	CIVIL	M. Sunny	M. Sunny
153	L.Mahesh	MINING	L. Mahesh	L. Mahesh
154	M.Rajkumar	MINING	M. Rajkumar	M. Rajkumar
155	K.Rakesh Kumar	MINING	K. Rakesh	K. Rakesh
156	G.Manohar	MINING		
157	V.Rajendra Prasad	MINING	V. Rajend	V. Rajend
158	SK.Thofiq	MINING	S. Thofiq	S. Thofiq
159	G.Prem Kumar	MINING	G. Prem	G. Prem
160	Dr.A.Srinivasu	MBA		
161	M.Shilpa	MBA		M. Shilpa
162	V.Sarada	MBA		V. Sarada
163	N.Anitha	MBA		N. Anitha
164	CH.Ramesh	MBA		CH. Ramesh
165	G.Varma	MBA	G. Varma	G. Varma
166	D.Venkanna	MBA		
167	G. Venkata Krishna	MATHS	G. Venkata	G. Venkata
168	T. Nagaraju	MATHS	T. Nagaraju	T. Nagaraju
169	N.Koti Reddy	MATHS	N. Koti Reddy	N. Koti Reddy
170	Ch.Bhaskar Reddy	MATHS	Ch. Bhaskar Reddy	Ch. Bhaskar Reddy
171	V.Kavitha	MATHS	V. Kavitha	V. Kavitha
172	Dr.P.Jyothi	MATHS	Dr. P. Jyothi	Dr. P. Jyothi
173	R.Edukondalu	MATHS	R. Edukondalu	R. Edukondalu
174	NCH Sridhar	MATHS	N. Ch. Sridhar	N. Ch. Sridhar
175	P.Ramakrishna	MATHS	P. Ramakrishna	P. Ramakrishna
176	D.Pandu Ranga Rao	ENGLISH	D. Pandu Ranga Rao	D. Pandu Ranga Rao
177	G.Venkateswarlu	ENGLISH	G. Venkateswarlu	G. Venkateswarlu
178	M.Suvarna	ENGLISH	M. Suvarna	M. Suvarna
179	SK.Fayazuddin	ENGLISH	SK. Fayazuddin	SK. Fayazuddin
180	K.Lakshmaiah	ENGLISH	K. Lakshmaiah	K. Lakshmaiah
181	J.Poorna Kumar	ENGLISH	J. Poorna Kumar	J. Poorna Kumar
182	Dr.K.Ramesh	ENGLISH	Dr. K. Ramesh	Dr. K. Ramesh


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			F.N	A.N
183	Dr.SK.Ummar Pasha	PHYSICS		
184	M.Narasimha Rao	PHYSICS		
185	Y.V.N.Damodara Rao	PHYSICS		
186	V.Lajapathi Rao	PHYSICS		
187	Y.Sri Devi	PHYSICS		
188	CH.Srinivasa Reddy	PHYSICS		
189	Dr.D.Hari Prasad	CHEMISTRY		
190	K.Srinivas	CHEMISTRY		
191	Dr.S.Pulla Reddy	CHEMISTRY		
192	H. Venkateshwara Rao	CHEMISTRY	OOLET Investigation Duty	
193	D.Chandrashekar Rao	CHEMISTRY		
194	K.Swathi	CHEMISTRY		
195	Ch.Vidya Sagar	H&S		
196	A.Chaitanya	H&S		
197	AVLV Prasada Rao	H&S	AVLV Prasada Rao	AVLV Prasada Rao
198	S.Dharma Bixam	H&S		
199	P.Kanakaiah	H&S		


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08 - 06 - 18



Agarva Anand addressing the faculty



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Suryapet (Dt.), Telangana-508206



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Ananthagiri (V & M), Suryapet (Dt)

Date: 06/06/2018

CIRCULAR

All the faculty members are here by informed that "A Three Day Faculty Development Program" will be held from 07th to 09th June 2018. All the faculty members should attend and make it a grand success.

S.No	Date & Time	Programme Name	Resource person
1	07.06.2018 10:00 – 16:30	Improving Teaching Effectiveness	Dr. A P Natarajan
2	08.06.2018 10:00 – 16:30	Entrepreneurship Development & IPR	Ms Apoorva Anand Conjeevaram
3	09.06.2018 10:00 – 16:30	Sponsored Research Programmes	Dr. S. V. Ranganayakulu


Venue: Auditorium (Block-E)

Reporting Time: 9:45 AM

Copy to

1. Secretary & Correspondent File
2. All HoD's
3. Circulate among the faculty members


PRINCIPAL


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Suryapet (Dt.), Telangana-508206

① M.E. - Auto
6/6/18

② ~~CE~~ Callan

③ MBA Q-2
6/6/18

④ CE C. Kelly

⑤ DIPLOMA - Q.
6/6/18

Q
6/6/18

⑥ Q. Pand H25

⑦ Q. Sule ECE.



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(Approved By AICTE, Permanently Affiliated to JNTU(H), Hyderabad & Accredited by NBA)

An Autonomous Institution

Ananthagiri(V&M), Suryapet(Dist.),Telangana.

PROGRAMME SHEET

Title of the Programme	:	Sponsored Research Programmes
Date	:	09th June 2018, Saturday
Focus	:	<ul style="list-style-type: none">• Best Practices while applying for various programs of AICTE, DRDO, DAE• Sponsored Research programs of UGC, MNRE, CSIR.• DST (INSPIRE, SERB, Women scientist, FIST, etc).
Programme Timmings		
Session 1	:	09:45 PM to 11:15 PM
Break	:	11:15 PM to 11:30 PM
Session 2	:	11:30 PM to 01:00 PM
Lunch	:	01:00 PM to 01:30 PM
Session 3	:	01:30 PM to 03:00 PM
Break	:	03:00 PM to 03:15 PM
Session 4	:	03:15 PM to 04:45 PM


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Dr S V Ranganayakulu

M.Sc., M.Phil., Ph.D., FIETE, FASI, FUSI

Dean – Research & Development

Profile

Dr S.V. Ranganayakulu is currently working as Dean (R&D), in Guru Nanak Institutions Technical Campus(Autonomous). He holds M.Sc (Physics) in Electronics as specialization, M.Phil (Physics) in the area of Liquid Crystals Displays (LCD) from Andhra University and Ph. D. in the area of Applied Ultrasonics from Osmania University, Hyderabad. He also holds NDT-Level II certification awarded by ASNDT. He has twenty seven years of teaching as well as administrative experience at postgraduate and undergraduate level at various institutions. He guided thirty two M.Phil Scholars and eight P.G. projects and is presently guiding six Ph.D scholars. He has to his credit fifty three research papers in international and national journals. He presented fifty seven research papers in National and International conferences. He is editorial board member in National and International Journals.

He is a Fellow of Institute of Electronics and Telecommunication Engineers (IETE), Acoustical Society of India (ASI) and Ultrasonic Society of India (USI). He also served as the member of Board of Studies in Post- graduation department of Electronics and P. G. Diploma in Instrumentation in Acharya Nagarjuna University for eight years. He delivered several invited and keynote talks in International and National conferences. He has executed three R&D projects in the area of Non Destructive Testing and Evaluation:

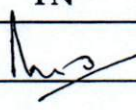
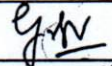

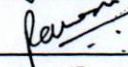
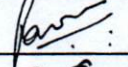

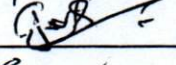
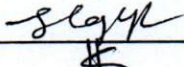



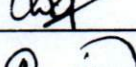
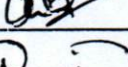
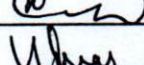
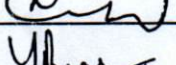
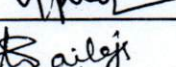
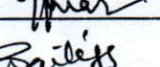
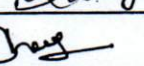
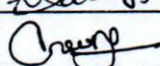
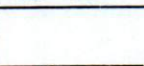
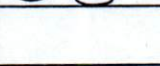
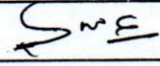





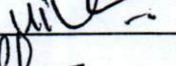
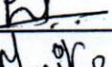

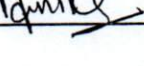
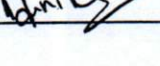
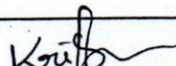
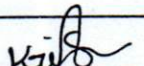
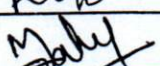
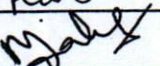

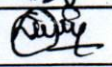


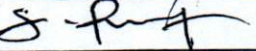

The first project is entitled “NDT Evaluation of Aerospace Materials” sanctioned by AICTE under Research Promotion Scheme; The second project entitled “Establishment of Acoustic Emission Technique for Quality assurance of SS Materials and other NDT Methods” sanctioned by BRFST under the department of Atomic Energy as a part of Nuclear Fusion Program; The third project entitled “Ultrasonic Investigation studies of Nano fluids” sanctioned by UGC-SERO under Minor Research Project program. He has been awarded with “Research Excellence” award by Indus Foundation for extensive contribution in research and development. He published 4 text books, filed five patents and industrial design as a part of Intellectual Property Rights (IPR). In the year 2016 an industrial design (No.268427) under IPR has been granted by Controller of Design, Indian patent office, Calcutta.


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FACULTY DEVELOPMENT PROGRAMME 09.06.2018

Sponsored Research Programmes


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6	G.V.S.CH.S.L.V. Prasad	CSE		
7	P.Gurulingam	CSE		
8	P.Sandeep Reddy	CSE		
9	CH.Krishna Prasad	CSE		
10	J.Nagaraju	CSE		
11	Y.Laxmi Prasanna	CSE		
12	M.Shailaja	CSE		
13	P. Niranjana Kumar	CSE		
14	K.Vijay Kumar	CSE		
15	K. Naresh Kumar	CSE		
16	Y.Bharath Bhushan	CSE		
17	T.Aruna	CSE		
18	CH.D.V.Girish	CSE		
19	P.Vishnu Vardhan	CSE		
20	G.Subhadra	CSE		
21	N.Mounika	CSE		
22	G.L.N.V. Kartheek	CSE		
23	K.Krishna Reddy	CSE		
24	N.Mahesh Babu	CSE		
25	G.Ramadevi	CSE		
26	V.Sujitha	CSE		
27	S.Rajeswari	CSE		


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28	CH.Venkata Navi	CSE	<i>Ch Venkata Navi</i>	<i>Ch Venkata Navi</i>
29	B.Lalithabai	CSE	<i>B Lalithabai</i>	<i>B Lalithabai</i>
30	V.Jaswanthi	CSE	<i>V Jaswanthi</i>	<i>V Jaswanthi</i>
31	N.Siva Kumar	CSE		
32	S.Saritha	CSE	<i>S Saritha</i>	<i>S Saritha</i>
33	P.Mahesh Goud	CSE	<i>P Mahesh Goud</i>	<i>P Mahesh Goud</i>
34	CH.Anjaiah	CSE	<i>CH Anjaiah</i>	<i>CH Anjaiah</i>
35	P.Nikitha	CSE	<i>P Nikitha</i>	<i>P Nikitha</i>
36	MD.Ayub Khan	CSE	<i>MD Ayub Khan</i>	<i>MD Ayub Khan</i>
37	K.Upender Rao	CSE	<i>K Upender Rao</i>	<i>K Upender Rao</i>
38	M.Navya	CSE	<i>M Navya</i>	<i>M Navya</i>
39	A.Naresh Kumar	CSE		
40	J.Vijayasree	CSE	<i>J Vijayasree</i>	<i>J Vijayasree</i>
41	Dr.V.Srinivasa Rao	ECE	<i>Dr V Srinivasa Rao</i>	<i>Dr V Srinivasa Rao</i>
42	Dr. N. Ravi Kumar	ECE		
43	Dr. B.B.M.Krishna Kanth	ECE		
44	Dr.B.Rajan	ECE		
45	Dr.G.Kiran Kumar	ECE	<i>Dr G Kiran Kumar</i>	<i>Dr G Kiran Kumar</i>
46	M. Basha	ECE	<i>M Basha</i>	<i>M Basha</i>
47	T.Sreedevi	ECE		
48	G.Shobha	ECE	<i>G Shobha</i>	<i>G Shobha</i>
49	S.Uday Kumar	ECE	<i>S Uday Kumar</i>	<i>S Uday Kumar</i>
50	V.Guruvaiah	ECE	<i>V Guruvaiah</i>	<i>V Guruvaiah</i>
51	Y.Venkateswarlu	ECE	<i>Y Venkateswarlu</i>	<i>Y Venkateswarlu</i>
52	N.Harika	ECE	<i>N Harika</i>	<i>N Harika</i>
53	L.Hari Prasad	ECE	<i>L Hari Prasad</i>	<i>L Hari Prasad</i>
54	R.Bhavya	ECE	<i>R Bhavya</i>	<i>R Bhavya</i>
55	R.Priyanka	ECE	<i>R Priyanka</i>	<i>R Priyanka</i>
56	P.Kowmudi	ECE	<i>P Kowmudi</i>	<i>P Kowmudi</i>
57	V.David	ECE	<i>V David</i>	<i>V David</i>
58	MD.Fareed Ahamad	ECE	<i>MD Fareed Ahamad</i>	<i>MD Fareed Ahamad</i>

[Signature]
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59	SK.Saida Babu	ECE		
60	D.Shirisha	ECE	Shirisha	
61	K.Koti Reddy	ECE	(KR)	KR
62	V.Kalyani	ECE		
63	V.Leelashyam	ECE	Leelashyam	Leelashyam
64	P.Laxmi	ECE	Laxmi	Laxmi
65	J.Usha	ECE	Usha	Usha
66	A.Sujitha	ECE		
67	M.Venkaatratnam	ECE	Ratna	Ratna
68	J.Sujitha	ECE	Sujitha	Sujitha
69	D.Rjeev Naik	ECE	D. Rjeev Naik	Innovation
70	P.Rajesh Naik	ECE	Rajesh Naik	Rajesh Naik
71	N.Venkateswarlu	ECE	NA	ID
72	K.Manasa	ECE	(MK)	(MK)
73	G.Mahesh	ECE	Mahesh	Mahesh
74	V.Varalaxmi	ECE		
75	K.Srinadh	ECE	K.Srinadh	K.Srinadh
76	N.Varoodhini	ECE	Varoodhini	Varoodhini
77	Dr.V.Jayaprakash Narayanan	EEE		
78	Dr.K.Rajangam	EEE	Rajangam	Rajangam
79	S. Chandra Sekar	EEE	Sekar	Sekar
80	J.Srinivasa Rao	EEE	Rao	Rao
81	T.Raghu	EEE	Raghu	Raghu
82	G.Satyanarayana	EEE	G.Satyanarayana	G.Satyanarayana
83	S.Yasoda Krishna	EEE	S. Yasoda Krishna	S. Yasoda Krishna
84	M.Srinu	EEE	Srinu	Srinu
85	B.Sreenu	EEE	Sreenu	Sreenu
86	K.Shiva Shanker	EEE	Shanker	Shanker
87	J.Suman	EEE	Suman	Suman
88	V.Achi Reddy	EEE	Achi Reddy	Achi Reddy
89	A.Suresh	EEE	Suresh	Suresh



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


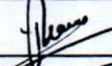
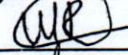




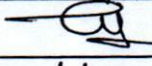
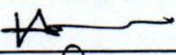

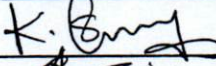
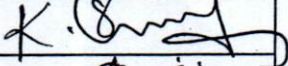



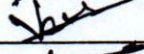

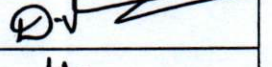


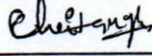
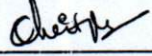
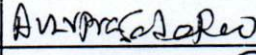
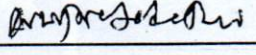

90	SK.Abdul Pasha	EEE		
91	N. Shankar	EEE	<i>Sh</i>	<i>Sh</i>
92	K. Mahesh	EEE	<i>mahesh</i>	<i>mahesh</i>
93	G. Rajesh	EEE	<i>R</i>	<i>R</i>
94	K. Sravanthi	EEE	<i>Sr</i>	<i>Sr</i>
95	B.Ramakrishna	EEE	<i>R</i>	<i>R</i>
96	D.Upendar	EEE	<i>D. Upendar</i>	<i>D. Upendar</i>
97	B.Srinu	EEE	<i>B. Sri</i>	<i>B. Sri</i>
98	L.Ashok	EEE	<i>A</i>	<i>A</i>
99	D.Firoz Kumar	EEE	<i>F</i>	<i>F</i>
100	S.Vijaya Kumar	EEE		
101	P.Paramesh	EEE	<i>P. Paramesh</i>	<i>P. Paramesh</i>
102	K.Rajashekar	EEE	<i>R</i>	<i>R</i>
103	N.Kiran Kumar	EEE	<i>K</i>	<i>K</i>
104	MD.Khaja Nizamuddin	EEE		
105	N.L.Santhi Nirmala	EEE	<i>N. Santhi</i>	<i>N. Santhi</i>
106	K.Rajani	EEE	<i>R</i>	<i>R</i>
107	Dr.R.Ganapati	MECH	<i>R</i>	<i>R</i>
108	K.Veeranjaneyulu	MECH	<i>V</i>	<i>V</i>
109	B.Biksham	MECH	<i>B</i>	<i>B</i>
110	L.Ramesh	MECH	<i>R</i>	<i>R</i>
111	P.Chitti Babu	MECH	<i>P. Chitti</i>	<i>P. Chitti</i>
112	Y.Rajesh Kanna	MECH	<i>Y</i>	<i>Y</i>
113	A.Suresh	MECH	<i>A</i>	<i>A</i>
114	E.Sadanandam	MECH	<i>E</i>	<i>E</i>
115	K.Bulli Babu	MECH	<i>B</i>	<i>B</i>
116	G.CH.Ganga Rao	MECH		
117	K.Kasinadham	MECH	<i>K</i>	<i>K</i>
118	J.Ashok	MECH	<i>A</i>	<i>A</i>
119	R.Laxman	MECH	<i>R. Laxman</i>	<i>R. Laxman</i>
120	K.Sudhakar	MECH	<i>Sudhakar</i>	<i>Sudhakar</i>

121	L.Vemana	MECH		
122	M.Ravi Kumar	MECH		
123	CH.Ramyasree	MECH		
124	J.Saidaiyah	MECH		
125	B.Devender	MECH		
126	N.Naveen	MECH		
127	D.Sreedhar	MECH		
128	S.Champulal	MECH		
129	E.Ramesh	MECH		
130	Dr.M.S.Siva Kumar	CIVIL		
131	C.Manikanta Reddy	CIVIL		
132	S.Kalyani	CIVIL		
133	M.Ashok	CIVIL		
134	D.Sravanthi	CIVIL		
135	G.Narender	CIVIL		
136	S.Naresh	CIVIL		
137	D.V.N.V.Lakshmi Alekhya	CIVIL		
138	CH.Babu Rao	CIVIL		
139	P.Sruthi	CIVIL		
140	P.Guruswamy	CIVIL		
141	N.Murali Krishna	CIVIL		
142	G.Siva Prasad	CIVIL		
143	P.Ananda Rao	CIVIL		
144	B.Rambabu	CIVIL		
145	A.Shiva Krishna	CIVIL		
146	SK.Rahaman	CIVIL		
147	M.Nagendra	CIVIL		
148	D.Satish Kumar	CIVIL		
149	SK.Shareef	CIVIL		
150	J.Mounika	CIVIL		
151	S.Papa Rao	CIVIL		

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152	Sunny	CIVIL	H. Sunny	H. Sunny
153	L. Mahesh	MINING	Mahesh	Mahesh
154	M. Rajkumar	MINING	Rajkumar	Rajkumar
155	K. Rakesh Kumar	MINING	Rakesh	Rakesh
156	G. Manohar	MINING		
157	V. Rajendra Prasad	MINING	Vijend	Vijend
158	SK. Thofiq	MINING	Thofiq	Thofiq
159	G. Prem Kumar	MINING	GPK	GPK
160	Dr. A. Srinivasu	MBA		
161	M. Shilpa	MBA	Shilpa	Shilpa
162	V. Sarada	MBA	Sarada	Sarada
163	N. Anitha	MBA	Anitha	Anitha
164	CH. Ramesh	MBA	Ramesh	Ramesh
165	G. Varma	MBA	Varma	Varma
166	D. Venkanna	MBA		
167	G. Venkata Krishna	MATHS	Venkata Krishna	Venkata Krishna
168	T. Nagaraju	MATHS	Nagaraju	Nagaraju
169	N. Koti Reddy	MATHS	Koti Reddy	Koti Reddy
170	Ch. Bhaskar Reddy	MATHS	Bhaskar Reddy	Bhaskar Reddy
171	V. Kavitha	MATHS	Kavitha	Kavitha
172	Dr. P. Jyothi	MATHS	Jyothi	Jyothi
173	R. Edukondalu	MATHS	Edukondalu	Edukondalu
174	NCH Sridhar	MATHS	Sridhar	Sridhar
175	P. Ramakrishna	MATHS	Ramakrishna	Ramakrishna
176	D. Pandu Ranga Rao	ENGLISH	Pandu Ranga Rao	Pandu Ranga Rao
177	G. Venkateswarlu	ENGLISH	Venkateswarlu	Venkateswarlu
178	M. Suvarna	ENGLISH	Suvarna	Suvarna
179	SK. Fayazuddin	ENGLISH	Fayazuddin	Fayazuddin
180	K. Lakshmaiah	ENGLISH	Lakshmaiah	Lakshmaiah
181	J. Poorna Kumar	ENGLISH	Poorna Kumar	Poorna Kumar
182	Dr. K. Ramesh	ENGLISH	Ramesh	Ramesh


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183	Dr.SK.Ummar Pasha	PHYSICS		
184	M.Narasimha Rao	PHYSICS		
185	Y.V.N.Damodara Rao	PHYSICS		
186	V.Lajapathi Rao	PHYSICS		
187	Y.Sri Devi	PHYSICS		
188	CH.Srinivasa Reddy	PHYSICS		
189	Dr.D.Hari Prasad	CHEMISTRY		
190	K.Srinivas	CHEMISTRY		
191	Dr.S.Pulla Reddy	CHEMISTRY		
192	H. Venkateshwara Rao	CHEMISTRY		
193	D.Chandrashekar Rao	CHEMISTRY		
194	K.Swathi	CHEMISTRY		
195	Ch.Vidya Sagar	H&S		
196	A.Chaitanya	H&S		
197	AVLV Prasada Rao	H&S		
198	S.Dharma Bixam	H&S		
199	P.Kanakaiah	H&S		

**This is a sample proposal to DST, Govt. of India.
To be used as a guideline only.**

Government of India
Department of Science & Technology
Technology Bhawan, New Mehrauli Road,
New Delhi-110 016

(The Investigator is requested to fill the project title below and address on the reverse)

ACKNOWLEDGEMENT CARD

Acknowledged with thanks the receipt of _____ copies of your research proposal
entitles _____

(For SERC Division)

Name: _____

Designation: _____

Date: _____

(Please detach and send along with the proposal. No postal stamp is required)

REVERSE SIDE:

Your DST reference No: _____ /SERC/ _____

(For any query quote this number)

To _____

PIN _____

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Endorsement from the Head of Institution*
(To be given on letter head)

Project Title: *Study and Analyses of Light Weight, High
Speed Robot Arms*

1. Certified that the Institute welcomes participation of **Dr. S.K. Saha** as the Principal Investigator and **Dr. S.P. Singh** as the Principal Co-Investigator for the project and that in the unforeseen event of discontinuance by the Principal Investigator, the Principal Co-Investigator will assume the responsibility of the fruitful completion of the project (with due information to DST) .
2. Certified that the equipment and other basic facilities as enumerated in Section 420 and such other administrative facilities as per terms and conditions of the grant, will be extended to the investigator(s) throughout the duration of the project.
3. Institute assumes to undertake the financial and other management responsibilities of the project.

Date: 24/9/02

Name and Signature of Head of Institution

Place: New Delhi

NB : In regard to the research proposals emanating from scientific institutions/laboratories under various scientific departments, the Head of institution is required to provide a justification indicating clearly whether the research proposal falls in line with the normal research activities of the institution or not and if not, the scientific reasons which merit its consideration by DST .

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Certificate from the Investigator

Project Title: *Study and Analyses of Light Weight, High Speed
Robot Arms*

1. I/ We agree to abide by the terms and conditions of the SERC research grant.
2. I/ We did not submit the project proposal elsewhere for financial support.
3. I/ We have explored and ensured that equipment and basic facilities (enumerated in Section 420) will actually be available as and when required for the purpose of the projects. I/We shall not request financial support under this project, for procurement of these items.
4. I/ We undertake that spare time on permanent equipment (listed in Section 350) will be made available to other users.
5. I/We have enclosed the following materials:

Items

Number of copies

- | | |
|---|--------------------------|
| a) Endorsement from the Head of Institution (on letter head) | One |
| b) Certificate from Investigator(s) | One |
| c) Details of the proposal from Section 101 to 500 (stitched) + one soft copy on 3 1/2" floppy, preferably in MS Word m Investigator(s) | 20 / 10 for IRPHA |
| d) Name and address of experts/institution interested in the subject/outcome of the project. | One |
| e) Sheet containing sections 101 to 192 | One |
| f) Cover sheet by the Investigator | One |

Date:

Place:

Name and signature of Principal Investigator (**Dr. S.K. Saha**)

3

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Names and Address of Experts

Prof. T. Nagarajan
Dept. of Mechanical Engineering
IIT, Madras, Chennai-600 036

Prof. Amalendu Mukherjee
Director, I.I.T., Kharagpur
Kharagpur-721 302, West Bengal

Prof. Mruthujaya/Dr. Ashitava Ghosal
Dept. of Mechanical Engineering
IISc, Bangalore-560 012

Prof. Amitabha Ghosh/Prof. Ashok Mallik
Dept. of Mechanical Engineering
IIT, Kanpur-208 016

Prof. C. Amarnath/Prof. Bharat Seth
Dept. of Mechanical Engineering
IIT, Bombay
Powai, Mumbai-400 076

Names of Institutes Interested in the Subject

All IITs; ISRO (Bangalore, Tiruvanantapuram); BARC (Mumbai);
IGCAR (Kalpakkam).

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**Study and Analyses of Light Weight, High
Speed Robot Arms**

*A project submitted to the Department of Science and
Technology, Government of India, New Delhi*

by

Dr. S. K. Saha
Dr. S. P. Singh


Department of Mechanical Engineering
Indian Institute of Technology, Delhi
Hauz Khas, New Delhi-110 016

Tel: 659 1135; Fax: 685 7753
Email: saha@mech.iitd.ac.in

September 25, 2002

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**FORMATS FOR SUBMISSION OF PROJECTS
(To be filled by applicant)
{Sections 101 to 192 to be on separate sheet(s)}**

- 101. Project Title:** *Study and Analyses of Light Weight, High Speed Robot Arms*
- 102. Broad Subject:** Engineering Sciences
- 103. Sub Area:** Robotics and Manufacturing
- 104. Duration in months:** 36months
- 105. Total cost:** 19.0 lakhs
- 106. FE Component:** NIL
- 107. Project Category:** Basic Research
-
- 111. Principal Inv.:** Dr. S.K. Saha
- 112. Designation:** Associate Professor
- 113. Department:** Mechanical Engineering
- 114. Institute Name:** IIT Delhi
- 115. Address:** Hauz Khas, New Delhi 110 016
- 116. Date of Birth:** Sept. 02, 1961; **Sex (M/F):** M
- 117. Telephone Fax Gram e-mail:** Tel (011)659 1135; Fax: 685 7753; Email: saha@mech.iitd.ac.in
- 118. Co-Investigator:** Dr. S.P. Singh
- 119. Designation:** Associate Professor
- 120. Department:** Mechanical Engineering
- 121. Institute Name:** IIT Delhi
- 122. Address:** Hauz Khas, New Delhi 110 016
- 123. Date of Birth:** Jan. 20, 1968; **Sex (M/F):** M

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**This is a sample proposal to DST, Govt. of India.
To be used as a guideline only.**

124. Telephone Fax Gram e-mail: Tel (011)659 1136; Fax: 685 7753; Email: singhsp@mech.iitd.ac.in

Project Title: *Study and Analyses of Light Weight, High Speed Robot Arms*

Registration No.....(to be filled by DST)

Principal Investigator.....Institution

I) Dr. S.K. Saha..... IIT Delhi

II) Dr. S.P. Singh (Co-PI)..... IIT Delhi,

191. Project summary (maximum 150 words)

The demand for faster, high payload capacity, energy efficient robot arms are increasing day by day. Since present industrial robot manipulators are made of rigid links whose weight to payload capacity ratio is high they cannot be used in high speed applications. Hence, the robot links should be made of low weight to payload capacity ratio. Such robot links can provide higher speed but they start vibrating. As a result, inaccuracies crop in. If their dynamics are studied properly, these inaccuracies can be controlled using a suitable control algorithm. Besides, the robot arms can be made of composite materials like Fiber Reinforced Composites (FRC), whose strength to weight ratio is high compared to the conventional materials like steel or aluminium.

In this project, a dynamic model for a serial-chain robot arm made of flexible links will be developed. Recursive algorithms based on the dynamic modeling using the Decoupled Natural Orthogonal Complement (DeNOC) matrices which was proposed by the principal investigator and applied successfully to *rigid* serial- (Saha, 1997; 1999a,b) and parallel-chain (Saha and Schiehlen, 2001) robot manipulators will be extended to *flexible* serial-chain robot arms. Besides, FRC will be examined as an alternative robot link material. Some preliminary work on FRC as robot link has been carried by the investigators (Mathan, et al, 1999; Singh, 2001). A two-link AC servo controlled robot arm will be fabricated to verify the simulation results. During the experiments, both conventional (say, aluminium) and FRC materials will be considered as robot links.

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192. Key words (maximum 6): Serial, Flexible, FRC, Dynamics, Simulation, Experiment.

200. Technical details

210. Introduction (under the following heads)

Traditionally, robot manipulators are made of rigid links, i.e., their weight to payload ratio is very high. This is believed to be necessary for accuracy and repeatability. However, it leads to higher material cost and increased energy consumption. Higher robot speeds can be achieved using lighter links in which case length to cross-section area ratio of the robot links has to be increased leading to elastic deformations during the manipulator operations. Such robot arms are termed as 'flexible,' which has low weight to payload capacity ratio. These deformations degrade the path-tracking performance of the end-effector. In order to improve their performance, it is necessary to compensate for these deflections by knowing their magnitude and direction through a suitable dynamic model. Alternatively, advanced materials like Fiber Reinforced Composites (FRC) having higher strength to weight ratio can be used to achieve high speed. Light weight high speed robot arms are quite attractive for space structure applications, e.g., as space robots, solar panel supports, and others. Thus, in this project, the following activities will be taken up:

1. Development of a dynamic model for a serial flexible robot arm;
2. Simulation algorithm for the flexible arm using the Decoupled Natural Orthogonal Complement (DeNOC) matrices that was proposed by the principal investigator and successfully applied to the rigid serial- (Saha, 1997; 1999a,b) and parallel-chain (Saha and Schiehlen, 2001) systems;
3. Fabrication of servo controlled two-link flexible arm using conventional material like aluminium;
4. Experimental verification of the simulation results;
5. Dynamic analysis of FRC robot arm using
 - rigid body algorithm developed in an earlier DST sponsored project (Saha, 1999a)
 - flexible body algorithm to be developed in this project.

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7. Using the above experimental setup, verify the simulation results of the FRC robot arms.

It is envisaged that the industries like, Indian Space Research Organization (ISRO), Bangalore, the Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, and private companies with fast assembly lines such as in TIMEX Watches, SAMTEL Colour Tubes, and others, may be interested with the proposed research results. ISRO has already begun research in the area of space robotics (Gupta, et. al., 1995), and IGCAR requires systems for the handling of control rods for their Fast Breeder Reactors (FBR) (IGCAR Pamphlet, 1995).

211. Origin of the proposal

The requirement of higher productivity has led to increased operating speeds for most industrial machinery, and the adaptability of a robotic arm can significantly influence the overall performance of the system. Comprehensive work has been published for the dynamic modelling of mechanical arms in which rigid links are assumed. Such an assumption limits the use of the mechanism in high speed, high payload capacity applications. The deficiency has motivated researchers to investigate the problems that result from the assumption of the flexible structure, e.g., in Cyril (1988), Theodore and Ghosal (1995), Shabana (1997), Gamarra-Rosado and Yuhara (1999), Ider, et al (2002) and others.

On the other hand, there is a considerable interest in the development of *recursive* forward dynamics algorithm required for computer simulation of robot arms (Featherstone, 1983; Rodriguez and Kreutz-Delgado, 1992; Saha, 1997; 1999a,b). Whereas the conventional forward dynamics programs for robot arms with rigid links require computations of order n^3 , i.e., $O(n^3)$ (Walker and Orin, 1982; Angeles and Ma, 1988),--- n being the number of links in a serial-chain robot---recursive algorithms need $O(n)$ calculations. The recursive algorithms are also known to be numerically stable (Cloutier, et al, 1995).

The recent successful application of the recursive forward dynamics algorithm for the rigid serial-chain robot manipulators (Saha, 1997; 1999a,b) to the parallel-chain (Saha and Schiehlen, 2001) manipulators has inspired the investigators to apply the recursive methodology to *flexible* systems as well. Furthermore, researchers are

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exploring composite materials as an alternative link materials for high speed robot applications, e.g., Sung and Shyl (1990) and Singh (2001). Some preliminary work in this direction by the investigators (Mathan, et al, 1999; Singh 2001) has inspired the team to investigate whether they can be treated as *rigid* or *flexible* in order to use them robot link materials, and also verify the results experimentally.

212. Definition of the problem

The primary problem is to investigate the applicability and efficiency of the recursive dynamics algorithm of Saha (1997, 1999a,b) for the dynamic simulation of flexible arms. The algorithm is developed for serial rigid-body robot arms and has slightly better efficiency (Saha, 1999b) than similar algorithms, e.g., with that of Featherstone (1983). The method is also different, which, in the investigators' opinion, is easy to grasp. The method is based on the linear algebra theory, namely, the Gaussian elimination of the symmetric positive definite inertia matrix, which is obtained from the fundamental Newton-Euler equations of motion and using the Decoupled Natural Orthogonal Complement (DeNOC) matrices (Saha, 1999a,b). Alternatively, the approach of Featherstone (1983) is based on the 'articulated-body inertia' matrix that relates a spatial force applied to a particular member of an articulated body to the spatial acceleration of that member by taking into account the effect of the rest of the articulated body. The method of Rodriguez and Kreutz-Delgado (1992) uses Kalman filtering and smoothing techniques appearing in Control theory. Note that the application of the DeNOC to parallel structures, e.g., Stewart Platform, has led to the *recursive, minimum-order, ODE (ordinary differential equation)*, dynamic formulation, which was not available earlier than Saha and Schihelen (2001).

The proposed computer simulation algorithm for the flexible arm manipulator will be tested with a 2-link experimental flexible arm. The flexible links will be independently controlled by two servomotors. The arm will be instructed to follow a given path. Actual path will be sensed through sensors, say, joint encoders, for the comparison of the simulation results. This comparison is important to judge the effectiveness of the proposed forward dynamics algorithm to be developed in this project. Moreover, it will help to design a controller to reduce the end-effector vibration. In order to achieve the high

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speed, Fiber Composite Reinforces (FRC) links will be considered as an alternative link material. The FRC will be modelled both as rigid and flexible. Experiments are also planned with FRC links.

213. Objective

1. Dynamic modelling of a two-link serial flexible arm;
2. Development of computer algorithms for simulation of a two-link flexible arm;
3. Fabrication of a 2-link flexible arm (say, using aluminium with high length to cross-section ratio) with servo motors;
4. Study the behaviour of the real arm and compare with the simulation results obtained from the algorithm developed in Step 2.
5. Study of a robot arm made with Fiber Reinforced Composite (FRC). The FRC links will be treated both as rigid and flexible;
6. Experimental verification of simulation results for the FRC links.

220. Review of status of Research and Development in the subject

221. International status

Research on robot arms with flexible arms and its control has started in the international arena since early 1970s (Ness and Farenkopf, 1971). Both theoretical and experimental are reported in the literature. Some of the work in the last decade is summerized below:

- *Cyril (1988), McGill University, Canada*: In this Ph.D work, a general method for the formulation of the dynamical equations of general n -axis, serial-type robotic manipulators of otherwise arbitrary architecture, with f flexible and r rigid links, i.e., $n=f+r$, is presented. Two different methods of formulations, namely, Newton-Euler and hybrid Newton-Euler/Euler-Lagrange, are discussed. The latter is found to be systematic and conceptually straightforward for flexible arms. A simulation package, FLEXLINK, is developed using the conventional forward dynamics algorithm. No experimental verification was carried out.
- *Yuh, et. al. (1989), Univ. of Hawaii, USA*: Dynamic model of a flexible link having rotational and translational motion is derived using the Lagrangian equations. The validity of this model was investigated by comparing the results of the computer simulation.

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- *Wang and Vidyasagar (1989, 1992), Univ. of Waterloo, Canada:* In the paper of 1989, some issues in the transfer function modelling of a single flexible link are examined. It was shown that when the number of modes is increased for more accurate modelling, the relative degree of the transfer function becomes ill-defined, which greatly affects the performance of the controller. An alternate approach was proposed. In the latter paper (1992), design related problem of a passive controller was discussed.
- *Book (1990), Georgia Institute of Tech., USA:* It summarized the contemporary works on flexible arms.
- *Yoshikawa and Hosoda, (1996), Japan:* A dynamic model was developed using virtual rigid links and passive joints. The simulation results were compared with 2-link experimental set-up. Later, a PD controller was used to stabilize the vibration.
- *Aoustin and Formal'sky (1997), Ecole Centrale de Nantes, France:* A near-optimal trajectory is designed for a flexible one-link manipulator, which is verified by an experimental set-up.
- *Ider et al (2002), Middle East Technical Univ., Turkey:* A control algorithm is proposed here based on the linearized dynamic model of a robot made with flexible links. The control is claimed to be stabilized while tracking a path accurately.

222. National status

In India, a variety of robotic research has been conducted, starting from typical industrial robot to advanced level mobile robots (both wheeled and walking types), teleoperation, underwater robots, etc., in various research institutes like Bhabha Atomic Research Center, Mumbai; Centre for Artificial Intelligence and Robotics, Central Manufacturing Technology Institute, and Indian Institute of Science (IISc), Bangalore; Indian Institutes of Technology (IITs), Bombay, Delhi, Kanpur, Kharagpur, and Madras; Jadavpur University, Calcutta, and others. Comprehensive description of these activities can be obtained in the DST Proceedings (1988), DSIR Report (1992), and NIE Proceedings (1996). Related to the flexible body modelling of robot arms, following contributions are traced in the national level:

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- *Gandhi, et. al. (1993), IIT, Delhi:* In this work a study of dynamic behaviour of a (R-R) nonplanar flexible manipulator subjected to a prescribed motion has been carried out. The dynamic equations of motion were derived from Hamilton's principle.
- *Ravi Sankar, et. al. (1995), IIT, Madras:* This paper presents a finite element method to calculate the end-effector deflection and actuator torques for the light weight flexible manipulators made up of composite materials.
- *Theodore and Ghosal (1995), IISc, Bangalore:* Comparison of two discretization techniques of flexible arms, namely, Assumed Mode and FEM, were done, where Lagrangian formulation was used for dynamic equations of motion. The results were illustrated by numerical simulation of a RRP configuration robot.
- *Bangara Babu and Nagarajan (1997), IIT, Madras:* This work deals with the effect of joint velocities on the dynamic performance of flexible manipulators. The dynamic equations of motion were derived from the Lagrangian principle. Simulation of a 3-link spatial manipulator was presented.
- *Thomas and Bandyopadhyay (1997), IIT, Bombay:* A controller is designed for the tip position control of a single-link flexible arm. The controller was shown to be robust to parameter variations and disturbances.
- *Mathan, Saha, and Singh (1998), IIT Delhi:* In this work, flexible body modelling is proposed, where conventional material like steel and aluminium and the advanced material like Fiber Reinforced Composite (FRC) are modelled as a flexible links. Their behaviours are compared and suitability of the FRC is established for high speed robot applications.
- *Singh (2001):* In this work, aluminium and FRC links are compared for the workspace, accuracy, and repeatability of the stepper motor driven HaPRA (Hanging Planar Robotic Arm) robot developed at IIT Delhi.

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Note that none of the above has carried out any experimental verification of the link vibrations. Moreover, the proposed project stands out mainly in the following ways:

1. Extension of a new recursive simulation technique (Saha, 1997; 1999a,b) to flexible manipulators;
2. Experimental verification of the simulation results for a two-link flexible arm made of aluminium and FRC.

223. Importance of the proposed project in the context of current status

It is certain that light weight, high-payload capacity robot manipulators are very much desirable for high-speed operation and energy efficiency. These requirements demand that the robot links should be flexible. Hence, accurate dynamic models are required for the study of end-effector deflection through simulation. The verification of such model is important, as they will be essential for the design of a good controller and stabilization of the vibration. If the FRC performs better, the composite materials could be good substitute for the conventional materials, as they are easily and economically available these days.

224. Review of expertise available with proposed investigating group/institution in the subject of the project

Dr. S.K. Saha has done his Ph.D. on Multibody dynamics at McGill University, Canada, in 1991. His research at Toshiba Corporation, Japan, from 1991 to 1995 was on dynamics of space robots, where he has developed its simulation software. Based on the Ph. D and Toshiba experiences, he has successfully developed two software RIDIM (Recursive Inverse Dynamics for Industrial Manipulator) and RFDSIM (Recursive Forward Dynamics and Simulation for Industrial

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Manipulator) in C++ as a part of his DST sponsored research project under the Scheme for Young Scientists. RIDIM is presently in use by the students of IIT Delhi for their Multibody Dynamics and Robotics courses. It is made freely available to other research/academic institutes (See www.angelfire.com/sc/saha). Besides, Dr. Saha has developed recursive dynamics algorithms for the parallel robotic structures (e.g., Stewart Platform) during his Humboldt Research (1999-2000) at the University of Stuttgart, Germany.

Dr. S.P. Singh has long been associated with the research in the area of vibration and control. He has significant contribution in carrying out several research projects on propeller shafts made of composites. His research work is focussed on design and development of composites for dynamic applications. His important research contributions include rotor-dynamic analysis of composite shafts, design of composite shaft for varied applications, design and development of composite crutch, damping predictions in composites. His current interests are in control and he has guided a number of research works in which useful algorithms for noise and vibration control have been developed and implemented. These include, efficient modal controller, Adaptive LMS controller for noise control, and fuzzy logic based controller for multi-modal control.

225. Patent details (domestic and international)

Key patents based on the worldwide patent search in the internet are as follows:

- Related to robot links modelled as flexible bodies

DE4133605 (Germany), "Flexible robot arm," by Fieten, W., Nov. 28, 1995.

US5,546,508 (United States), "Controlling flexible robot arms using high speed dynamics process," by Jain, A., Rodriguez, G., April 3, 1992.

US4,393,728 (United States) [Equivalent to JP56003193 (Japan), EP0017016 (Europe)], "Flexible arm, particularly a robot arm," by Larson, O., and Davidson, C., July 19, 1983.

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- Related to robot links made of composite materials

US6,431,019 (United States), "Low cost, high-strength robotic arm," by Greene, M.L., DeVane, S.J., and Tallman, J., Mar. 21, 2001.

US5,647,747 (United States), "Mechanized robots for use in instruction, training, and practice in the sport of ice and roller hockey," by Macri, V.J., Magaw, R.O., and Zilber, P., Jan. 20, 1995.

EP0576739 (Europe), "Welding gun," Gerbi, M., Jan. 05, 1994.

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230. Work plan

231. Methodology

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The methodology is outlined as follows:

1. *Literature survey*: The existing approaches to develop the dynamic model of a flexible link robot arm are:

- Euler-Lagrange (EL) equation and Assumed Mode Method (AMM);
- EL and Finite Element Method (FEM);
- Newton-Euler (NE) equation and AMM;
- NE and FEM.

In the above methods, AMM or FEM is used to discretize the flexible links, whereas the EL or NE equations describe dynamic equations of motion. NE method lends itself to very efficient recursive computations for dynamics of rigid-body manipulator. However, the NE recursions for complex systems like those containing flexible bodies are not directly applicable. On the other hand, the Euler-Lagrange (EL) method is conceptually much simpler, with the added advantage of not having to consider the internal forces and moments. However, straightforward implementation requires a great amount of lengthy partial differentiation, which also render these equations computationally less efficient than the other methods. In this project, a hybrid NE/EL (Cyril, 1988) will be used in which discretization will be carried out by both the AMM and FEM for comparison purpose.

2. *Simulation*: Having developed the dynamic equations of motion based on the methodology given in Cyril (1988), the recursive forward dynamics algorithm of Saha (1997, 1999a,b) will be used for simulation. The algorithm (Saha, 1999) is based on the application of the use of the Decoupled Natural Orthogonal Complement (DeNOC) and Gaussian Elimination (GE) rules to the expressions of the elements of the inertia matrix resulting from the dynamic equations of motion of the system at hand. This leads to the recursive expressions for the solution of the joint accelerations resulting an order n algorithm, i.e., $O(n)$. Commonly known approaches, e.g., Walker and Orin (1982), use the Cholesky decomposition [It is equivalent to GE of the symmetric positive definite inertia matrix.] of the inertia matrix whose elements are numbers. The latter gives rise to $O(n^3)$ algorithm because the recursiveness is not detectable. Both conventional material like aluminium and advanced material like Fiber Reinforced Composites will be considered as robot link materials.

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3. *Experimental Set-up*: To verify the above simulation results, a 2-link 2-revolute jointed planar flexible arm will be built, which will be controlled by two independent servo motors.
4. *Study and Comparison*: Computer simulation and experimental results will be compared for the validation of the dynamic model and its forward dynamics algorithm.

232. Organisation of work elements

1. Discretization of a flexible link and the development of its dynamic model;
2. Kinematics study of the two-link serial flexible arm;
3. Write forward dynamics and simulation algorithm for the two-link flexible arm;
4. Use the algorithm of Step 3 to simulate;
5. Fabricate a prototype;
6. Carry out experiment and compare with computer simulation results.

**233. Time schedule of activities giving milestones
(also append to bar diagram and mark it as Section
410)**

0--12 months:

- Literature survey
- Recruitment of Research Associate
- Analysis of a single-link flexible arm
- Upgradation of computing facilities
- Study and selection of composite materials
- Design of experimental setup

13--24 months:

- Recruitment of JRF

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- Analysis of two-link flexible arm
- Development of a simulation algorithm and obtain simulation results for the two-link arm to be built
- Procurement of the links, servo motors, and data acquisition systems for the two-link arm
- Fabrication of the two-link flexible arm.
- Testing of the experimental setup

25--36 months:

- Experiment with the two-link flexible arm when link material is (i) aluminium; and (ii) FRC
- Debugging
- Documentation

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**234. Suggested plan of action for utilization of
research outcome expected from the project.**

(300)BUDGET ESTIMATES: SUMMARY

N	Item	BUDGET			(in Rupees)
		1st Year	2nd Year	3rd Year	Total
A.	Recurring				
	1. Salaries/ wages	1,93,200	3,76,800	3,76,800	9,46,800
	2. Consumables	10,000	25,000	25,000	60,000
	3. Travel	15,000	30,000	30,000	75,000
	4. Other costs	70,200	2,24,000	1,44,000	4,38,200
B.	Equipment	--	3,80,000	--	3,80,000
	Grand total (A+B)	2,88,400	10,35,800	5,75,800	19,00,000
	Total FEC*				

***FEC- Foreign Exchange Component**

Foreign Exchange component (in US\$) equivalent of rupee amount at the prevailing rates may be furnished.

N.B. Entries here should match with those given in section 310 to 350; justification for each item is to be given in Section following it that is section 311, 321, 331, 341 and 351.

310. BUDGET FOR SALARIES/WAGES

Designation & number of persons	Monthly Emoluments	BUDGET			(in Rupees)
		1st Year (m.m.*)	2nd Year (m.m.)	3rd Year (m.m.)	Total (m.m.)
Research Associate	16,100	1,93,200 (12)	1,93,200 (12)	1,93,200 (12)	5,79,600 (36)
JRF	13,300	--	1,59,600 (12)	1,59,600 (12)	3,19,200 (24)
Attendant	4,000	--	24,000 (6)	24,000 (6)	48,000 (12)
Total		1,93,200	3,76,800	3,76,800	9,46,800

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***m.m.:man months to be given within brackets before the budget amount**

311. Justification for the manpower requirement

One person is required with M. Tech or equivalent degree to conduct the advanced analysis. The position requested is Research Associate with a pay of Rs. 11,500/- per month (as per DST O.M. No.SP/S9/2-23/97 dt. 24.2.98). Another person would be taken in the second year onwards in order to do the analysis of composite materials and carry out the experiments. This candidate is placed in the JRF category with pay of Rs.9,500/- per month. Since there is a provision to pay House Rent and Medical allowance, about 40% additional amount is put in the budget.

320. BUDGET FOR CONSUMABLE MATERIALS

Item	BUDGET			(in Rupees)
	1st Year	2nd Year	3rd Year	Total
Q*				
B**	10,000	25,000	25,000	60,000
F***	--	--	--	--
Total B	10,000	25,000	25,000	60,000
F	--	--	--	--

***Q: Quantity or number, ** Budget, ***F: Foreign Exchange Component in US\$**

321. Justification for costly consumable (if not provided for in Section 231 i.e. Methodology)

Since the experimental work will start from 2nd year, link materials, small parts, cables, electronic circuitry, etc. may be required besides regular requirement of papers, printer cartridges, floppies, CDs, etc., the budget in the last two years are kept little high.

330. BUDGET FOR TRAVEL

	BUDGET			(in Rupees)
	1st Year	2nd Year	3rd Year	Total

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Travel (Only inland travel)	15,000	30,000	30,000	75,000
------------------------------------	--------	--------	--------	--------

331. Justification for intensive travel, if any.

A few trips are envisaged to discuss the problem with the people working in this area, visit places having similar set-ups, finalizing the purchases with the suppliers, and attending conferences/symposium for the dissemination of the result. In the second and third years, it is more because there may be more visits to attend seminars/conferences.

340. BUDGET FOR OTHER COSTS/CONTINGENCIES

	BUDGET			(in Rupees)
	1st Year	2nd Year	3rd Year	Total
Other costs/ Contingency costs	6,000	12,000	12,000	30,000
Consumable	4,200	12,000	12,000	28,200
Institute Overheads (20%)	60,000	2,00,000	1,20,000	3,80,000
Total	70,200	2,24,000	1,44,000	4,38,200

341. Justification for specific costs under other costs, if any.

Contingencies are kept for fabrication charges, buying books (if necessary), etc.

350. BUDGET FOR EQUIPMENT

Sl. No.	Generic name of the Equipment along with make & model	Imported/Indigenous	Estimated Costs (in Foreign Currency also)*	Spare time for other users (in %)
1	AC Servo Motors (2)	Imported#	1,30,000	20%
2	2-axes Controller	Imported	1,20,000	20%

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	card			
3	Data Acquisition System	Imported	70,000	20%
4	PC based Controller Interface	Imported	60,000	20%
		Total	3,80,000	

*** includes transport, insurance and installation charges.**

Available in Indian Rupees

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351. Justification for the proposed equipment.

AC motors are proposed for feedback control of the systems. Controller cards are necessary to be connected with through a PC interface. The data acquisition system is necessary to get the encoder readings to compare with the simulation results.

410. Time Schedule of Activities through BAR Diagram

Activities	Months					
	1-6	7-12	13-18	19-24	25-30	31-36
Literature survey						
Staff Recruitment						
Computer upgradation						
Flexible analyses with 1 & 2 links						
Composite link design						
Experiment development						
Validation						
Debugging & report						

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420. List of facilities being extended by parent institution(s) for the project implementation.

A) Infrastructural Facilities:

Sr. No.	Infrastructural Facility	Yes/No/ Not required Full or sharing basis
1.	Workshop Facility	Yes
2.	Water & Electricity	Yes
3.	Laboratory Space/ Furniture	Yes
4.	Power Generator	Yes
5.	AC Room or AC	Yes
6.	Telecommunication including e-mail & fax	Yes
7.	Transportation	Yes
8.	Administrative/ Secretarial support	Yes
9.	Information facilities like Internet/ Library	Yes
10.	Computational facilities	Yes
11.	Animal/ Glass House	Not required
12.	Any other special facility being provided	Not Applicable

B. Equipment available with the Institute/ Group/ Department/ Other Institutes for the project:

Equipment available with	Generic Name of Equipment	Model, Make & year of purchase	Remarks including accessories available and current usage of equipment
PI & his group	CRO	HP, 2002	20%
PI's Department	Function Generator	Tektronix	20%
Other Inst In the region	Not Required	Not Required	Not Applicable

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To be used as a guideline only.**

430. Detailed Bio-data of the Investigator

Name: Dr. Subir Kumar Saha

Address: Department of Mechanical Engineering, IIT Delhi, Hauz Khas, New Delhi 110 016, Tel: 659 1135; Fax: 685 7753; Email: saha@mech.iitd.ac.in

Date of Birth: September 02, 1961

Institution's Address: IIT Delhi, Hauz Khas, New Delhi 110 016

Academic Qualifications:

<i>Degree</i>	<i>Year</i>	<i>College/Institute/University</i>	<i>Discipline/Thesis</i>
Ph. D	Oct., 1991	McGill University, Canada	Dynamics of Robotic Systems
M. Tech	May, 1985	IIT Kharagpur, India	Machine Tool Engineering
B.E	May, 1983	RE College, Durgapur, India	Mechanical Engineering

Experience

<i>Duration</i>	<i>From</i>	<i>Organization</i>	<i>Position</i>	<i>Responsibility</i>
Teaching				
2 yrs +	Jan.'00	IIT Delhi	Associate Prof.	Teaching/Supervision/Research/Consultancy
3.5 yrs	July'96	-- do --	Assistant Prof.	-- do --
10 mos	Aug.'95	IIT Madras	Visiting Faculty	-- do --
Industrial				
3 yrs 9 mos	Nov.'91	R&D Center, Toshiba Corp., Japan	Research Scientist	Space robot simulation
8 mos	May'84	IISCO (SAIL), Burnpur, India	Management Trainee	M/c shop supervision
Others				

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2 mos	May'02	McGill Univ., Canada	Visiting Researcher	Multibody dynamics
9 mos	May'99	Univ. of Stuttgart, Germany	Humboldt Fellow	Parallel robot dynamics

Professional Achievements

- *Patent*: One submitted in Japan, Feb'94
- *Design Registration*: Four, India, Mar'02
- *Publications [48]*: Journal 16 (Int. 13); Conf. Proc. 32 (Int. 20)
- *Software Developed*: **IIT Delhi**—RIDIM'99 (Robot Control); RFDSIM'99 (Robot simulation); VRL'98 (Virtual Robotics Laboratory). **Toshiba Corp.**—SpaceDyn'95 (Space robot dynamics). **McGill University**—OMNI'91 (AGV simulation)
- *Research and Consultancy*: Completed 5 (INR 1,722,000=US\$34,440); On-going 5 (INR 11,362,00=US\$22,724)

Honours

- *Humboldt Fellow*: Alexander von Humboldt Foundation, Germany, 1999.
- *Dean's Honors List*: McGill University, Canada, 1991 (for an excellent Ph. D. thesis)
- *Newspaper Interviews*: Nikkei Sangyo Shinbun [Japanese], Japan, 1993 (Sub: NOC method); The Nikkei Weekly [English], Japan, 1992 (Sub: Indian Engineer)
- *Who's Who*: Listed in MARQUIS Who's Who in the World, USA, 13th Ed., 1995; International Directory of Distinguished Leadership, ABI Inc., USA, 1999;
- *Journal Reviewers*: International Journal of Robotic Systems, USA; ASME Transactions: Journal of Mechanical Design; International Journal of the Robotics Society of Japan; IEEE Transactions on Robotics and Automation.

Professional Membership

- *Member*: IEEE (since 1991); SAE (since 1997); IE (since 1997) & AMM (since 1995), India

Extra-Curricular Activities

- *Foreign Languages*: Japanese (Fluent); French and German (Little)
- *Hobbies*: Traveling, Playing squash/badminton/tennis, Reading novels, Acting

Publications list (51):

Journal (16) [• Int. 13; o Nat. 3]

2001 (2)

**This is a sample proposal to DST, Govt. of India.
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- SAHA, S.K., "Dynamic simulation of serial manipulators using the UDU^T decomposition of the inertia matrix," *Multibody System Dynamics*, accepted in June 2001.
 - SAHA, S.K., and Schiehlen, W.O., "Recursive kinematics and dynamics for closed loop multibody systems," *Int. J. of Mechanics of Structures and Machines*, V. 29, N. 2, Aug., pp. 143-175.
- 1999 (2)
- SAHA, S.K., "Dynamic modelling of serial multi-body systems using the decoupled natural orthogonal complement matrices," *ASME J. of Applied Mechanics*, V. 66, Dec. pp. 986--996.
 - SAHA, S.K., "Analytical Expression for the inverted inertia matrix of serial robots," *Int. J. of Rob. Res.*, V. 18, N. 1, Jan., pp.116--124.
- 1997 (1)
- SAHA, S.K., "A decomposition of the manipulator inertia matrix," *IEEE Trans. on Rob. & Aut.*, V. 13, N. 2, Apr., pp. 301--304.
- 1996 (2)
- SAHA, S.K., "Inverse dynamics algorithm for space robots," *Trans. of the ASME, J. of Dynamic Systems, Measurement and Control*, V. 118, Sept., pp. 625--629.
 - SAHA, S.K., "A unified approach to space robot kinematics," *IEEE Trans. on Rob. & Aut.*, V. 12, N. 3, June, pp. 401--405.
- 1995 (4)
- SAHA, S.K., "A concept of Primary Body for kinematics of free-flying space robots," *Systems, Control and Information Trans.*, Japan, V. 8, N. 10, pp. 529--534.
 - SAHA, S.K., Angeles, J., Darcovich, J., "The design of kinematically isotropic rolling robots with omnidirectional wheels," *Int. J. of Mechanism and Machine Th.*, V. 30, N. 8; pp. 1127--1137.
 - SAHA, S.K., "Plant robotics in India," *J. of Plant Engineering*, Silver Jubilee Issue, Oct., pp. 59--62.
 - SAHA, S.K., Chakrabarti, A.K., and Chattopadhyay, A.B., "A comparative study on the performance of cast ZA alloy bearings," *Trans. Indian Institute of Metals.*, V. 48, N. 2, pp. 121-123.
- 1991 (2)
- Angeles, J., SAHA, S.K., and Lopez-Cajun, C.S., "The design of cam mechanisms with translating flat-face followers under curvature constraints," *ASME J. of Mechanical Design*, V. 116, Mar., pp. 306--310.
 - Angeles, J., SAHA, S.K., Gonzalez-Palacios, M., and Lopez-Cajun, C.S., "The design optimization of cam mechanisms with oscillating flat-face followers under curvature constraints," *ASME J. of Mechanical Design*, V. 116, Mar., pp.311--314.
- 1991 (2)

**This is a sample proposal to DST, Govt. of India.
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**This is a sample proposal to DST, Govt. of India.
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- SAHA, S.K., and Angeles, J., "The mathematics of motion simulation: a case study," *Int. J. of Mathematical & Computer Modelling*, V. 15, N. 10, pp. 61--77.
- SAHA, S.K., and Angeles, J., "Dynamics of nonholonomic mechanical systems using a natural orthogonal complement," *ASME J. of Applied Mechanics*, V. 58, Mar., pp. 238--243.

1987 (1)

- Saha, D.K., Mohanty, O.N., SAHA, S.K., and Chattopadhyay, A.B., "Cryo-jet cooled grinding," *J. of the Association of Engineers, India*, V. 62, pp. 36—42.

Conference Proceedings (32) [• Int. 20; ○ Nat. 15]

2002 (5)

- SAHA, S.K., "Modeling constrained systems with the natural orthogonal complement: Recursive algorithms," Notes of the Workshop T3/Tutorial T2: Topics in Modeling, Simulation and Implementation of Real-Time Robotic Systems, *IEEE Conf. on Robotics and Automation*, May 11-15, Washington DC, pp. IV1-29.
- SAHA, S.K., "Mechatronics-What and why?," (Abstract) Lecture Notes, ISTE Short Term Training Programme on Mechatronics & Automation, SLIET, Longwal, Jan. 7-18, pp. SKS-I-1-2.
- SAHA, S.K., "Modelling and simulation of physical systems," (Abstract) Lecture Notes, ISTE Short Term Training Programme on Mechatronic & Automation, SLIET, Longwal, Jan. 7-18, pp. SKS-II-1.
- SAHA, S.K., "Robotics," (Abstract) Lecture Notes, ISTE Short Term Training Programme on Mechatronics & Automation, SLIET, Longwal, Jan. 7-18, pp. SKS-III-1
- SAHA, S.K., Kar, I.N., Kumar, A., Jha, R., Momaya, K., Bhalla, M., and Gupta H., K., "A straightening strategy for the automobile industries," *Proc. of the 2nd Int. SAE-INDIA Mobility Conference*, IIT Cheennai, Jan. 10-12, pp. 393-398

2001 (4)

- Saha, S.K., "An inverse dynamics software for serial robots," *Proc. of the Nat. Conf. of Mach. and Mech. (NACOMM)*, IIT Kharagpur, Dec. 21-22, pp. 131-138.
- Bhangale, P., Saha, S.K., and Agrawal, V.P., "Concept of decoupled natural orthogonal complement (DeNOC) for robot architecture selection," *Proc. of the Nat. Conf. of Mach. (NACOMM)*, IIT Kharagpur, Dec. 21-22, pp. 177-184.
- Chandrashekar, SAHA, S.K., and Kundra, T.K., "Modelling of a CNC milling positioning system," *Proc. of the IE(I) XVth Nat. Convention of Production Engineers & Nat. Sem. on Emerging Convergence in Manufacturing Systems*, Bhopal, Mar. 3-4, pp. 49FA-54FA.
- Dorlikar, P., Bhangale, P., SAHA, S.K., and Agrawal, V.P., "Study of robots using ADAMS," *Proc. of the IE(I) XVth Nat. Convention of Production Engineers*

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& Nat. Sem. on Emerging Convergence in Manufacturing Systems, Bhopal, Mar. 3-4.

2000 (2)

- SAHA, S.K., "Dynamics for machine tool component design," Proc. of the 19th All India Manufacturing, Design and Research (AIMTDR) Conf., IIT Madras, Chennai, Dec. 14-16, pp. 261--266.
- Jain, A., SAHA, S.K., and Mukherjee, S., "Design methodology for a HEXAPOD machine tool," Proc. of the 19th AIMTDR, IIT Madras, Chennai, Dec. 14-16, pp. 279--284.

1999 (3)

- SAHA, S.K., "Simulation of industrial manipulators based on the UDU^T decomposition of inertia matrix," Proc. of the EUROMECH Colloquium, Lisbon, Portugal, Sept. 20-23.
- Mathan, R., SAHA, S.K., Singh, S.P., "Behaviour of robot links made of fiber reinforced composite material," Proc. of the Int. Symp. in Motion & Vibration Control in Mechatronics, Tokyo, Japan, Apr. 6-7.
- Baghla, D., Anurag, A., SAHA, S.K., Sharma, Prasenjit, S., and Mehta, G.R., "Development of a hanging planar robotic arm (HaPRA)," Proc. of the 11th ISME Conf., IIT Delhi, Feb. 3-5, pp. 93-98.

1998 (3)

- SAHA, S.K., and Petkar, S., "Dynamic modelling for serial manipulator control," Proc. of the Int. Symp. on Intelligent Robotics Systems, Bangalore, India, Jan. 10-12, pp. 351-358.
- Arora, D., SAHA, S.K., and Basamboo, A., "A simple gripper design for cylindrical objects," Proc. of the 18th AIMTDR Conf., Dec., 21-23, IIT Kharagpur, pp. 496-5501.
- SAHA, S.K., "Virtual Prototyping of Mechanical Systems," Proc. of the SERC School, IIT Delhi, Nov. 2-14, pp. 162-169.

1997 (4)

- Momaya, K., and SAHA, S.K., "Technological upgradation in Japanese Firms: A case of large high-tech firms," Proc. of the Int. Conf. on Management of Technology, IIT, Delhi, India, Dec. 21-24, pp. 325--333.
- SAHA, S.K., and Goel, S.K., "Dynamic modelling of serial-link mechanisms," Proc. of the Nat. Conf. on Machines and Mechanisms, IIT Kanpur, India, Dec. 12-13, D-49--D-54.
- SAHA, S.K., "Robotics in India," Proc. of the Inst. of Engrs. (I) Nat. Sem. on Modern Trends in Manufacturing Technology, Nov. 6-8, New Delhi, pp. 215--221.
- Venugopal, S, and SAHA, S.K., "Interactive design for industrial robots," Proc. of the AIMTDR Conf., Jan 9-11, Warangal, pp. 201--205.

1996 (1)

**This is a sample proposal to DST, Govt. of India.
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- SAHA, S.K., "Symbolic generation of the inertia matrix," Abstracts of the Int. Congress on Theoretical & Applied Mechanics, Kyoto, Japan, Aug. 25-31, 1996.
- 1995 (3)
- SAHA, S.K., "Dynamic Modeling using the DeNOC," Proc. of the Int. Conf. on Automation, Indore, India, Dec. 12-14.
 - SAHA, S.K., "Symbolic factorization of inertia matrix for space robot simulation," Proc. of the 34th SICE Annual Conf., Sapporo, Japan, July 26-28, Int. Sess., pp. 1137--1142.
 - SAHA, S.K., "The UDU^T decomposition of manipulator inertia matrix," Proc. of the IEEE Int. Conf. on Robotics and Automation, Nagoya, Japan, May 21-27, V. 3, pp. 2829--2834.
- 1994 (2)
- SAHA, S.K., "An efficient algorithm for kinematic control of free-floating space robots," Proc. of the Asian Control Conf., Tokyo, Japan, July 27-30, V. 1, pp. 281--284.
 - SAHA, S.K., "A new method for kinematics of space robots," Proc. of the Japan-USA Symp. on Flexible Aut., Kobe, Japan, July 11-13, V. II, pp. 447--450.
- 1993 (2)
- SAHA, S.K., "Modeling and simulation of space robots," Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots & Systems, Yokohama, Japan, July 26--30, V. 3, pp. 2033--2040.
 - SAHA, S.K., Angeles, J., and Darcovich, J., "The kinematic design of a 3-dof isotropic mobile robot," Proc. of the IEEE Int. Conf. on Robotics and Automation, Atlanta, USA, May 2-7, V. 1, pp. 283--288.
- 1991 (2)
- SAHA, S.K., and Angeles, J., "The formulation of kinematic constraints in design-oriented machine dynamics," Proc. of the ASME Des. Aut. Conf., Miami, USA, Sept. 22-25, pp. 115--122.
 - SAHA, S.K., and Angeles, J., "On the formulation of linear homogeneous velocity constraints in mechanical systems," Proc. of the 13th Canadian Cong. of Appl. Mech., University of Manitoba, Winnipeg, Canada, June 2-6, V. 2, pp. 658--659.
- 1989 (3)
- Angeles, J., Lopez-Cajun, C.S. and SAHA, S.K., "Curvature constraints in the design of cam mechanisms. Part I. Translating flat face followers," Proc. of the ASME Des. Aut. Conf., Montreal, Canada, V. 2, pp. 259--264.
 - Angeles, J., Lopez-Cajun, C.S. and SAHA, S.K., "Curvature constraints in the design optimization of cam mechanisms. Part II. Oscillation flat face followers," Proc. of the ASME Des. Aut. Conf., Montreal, Canada, V. 2, pp. 265--269.
 - SAHA, S.K., and Angeles, J., "Kinematics and dynamics of a three-wheeled 2-dof AGV," Proc. of the IEEE Conf. on Robotics and Automation, Scottsdale, USA, May 14-19, V. 3, pp. 1572--1577.

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1986 (1)

- SAHA, S.K., Chakraborty, A.K., and Chattopadhyay, A.B., "On machinability characteristics of zinc-aluminium alloys," Proc. of the Int. Symp. on Zinc-Aluminum Alloys: 25th Annual Conf. of Metallurgists, Toronto, Canada, Aug. 17-20, pp. 59--70.

Patent list, if any:

- *Patent*: One submitted in Japan, Feb'94
- *Design Registration*: Four, India, Mar'02 (Carpet Hand Tools)

List of Projects implemented:

1. Robot Design Using Dynamic Motion Study, DST (Scheme for Young Scientists), 1997-1999.
2. Investigation and Optimum Selection of Mechatronic Components, MHRD (Thrust Area Project), 1999-2001.
3. Data Base and Software Development for an Automatic Rack-bar Straightening Machine, Sona Koyo Steering Systems (P) Ltd., 2000-2001.

430. Detailed Bio-data of the Co-Investigator

Name: Dr. S.P. Singh

Address: Department of Mechanical Engineering, IIT Delhi, Hauz Khas, New Delhi 110 016, Tel: 659 1135; Fax: 685 7753; Email: singhsp@mech.iitd.ac.in

Date of Birth: 20 Jan 1968

Institution's Address: IIT Delhi, Hauz Khas, New Delhi 110 016

Academic Qualifications:

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Degree	Institution	Year	Marks	Honors
Ph.D. (Mech.Design)	IIT, Delhi	1992	10.0/10	Highest CGPA
M.Tech (Design of Mechanical Equipment)	IIT, Delhi	1989	10.0/10	Highest CGPA.
B.E. Hons.(Mechanical)	Punjab Univ.	1987	89%	First in University.
Pre- Engineering	Punjab Univ.	1983	84%	First in Punjab State

Experience

Period	Post	Department	Institute
July 96 onwards	Asstt. Prof.	Dept. of Mechanical Engg.	IIT, Delhi
Jan 95 to July 96	Asstt. Prof.	Mech. M/c Design &Automation Engg	Regional Engineering College, Jalandhar.
Sept 93 to Jan 95	Lecturer	Dept. of Mech. And Industrial Engg.	Thapar Institute of Engg. and Technology Patiala.
Jan 89 to Aug 89	Lecturer	Mechanical Engg. Dept.	G.N. Engineering College, Ludhiana.

Publications list (Title of paper, authors, Journal details, pages, year etc.)

JOURNAL

1. S.P. Singh and K. Gupta, "Damped free vibrations of Layered Composite Cylindrical Shells", Journal of Sound and Vibration, Vol. 172, No.2 (1994) pp191-209.
2. S.P.Singh and K. Gupta, "Composite Shaft Rotordynamic Analysis using a Layerwise Shell theory" Journal of Sound and Vibration Vol. 191 No. 5 (1996) pp. 739-756.
3. S.P.Singh and K. Gupta, "Free Damped Flexural Vibration Analysis of Composite Cylindrical Tubes using Beam and Shell theories". Journal of Sound and Vibration Vol. 172, No.2 (1994) pp. 171-190.
4. S.P.Singh and K. Gupta, "Rotordynamic Experiments on Composite Shafts," ASTM Journal of Composite Technology and Research" Vol. 18, No. 4 (1996) pp. 256-264.
5. S.P.Singh and K. Gupta and H.B.H. Gubran, "Developments on Composite Material Shafts" International Journal of Rotating Machinery 1997 Vol. 3, pp. 189-198.
6. S.P.Singh and K. Gupta, "Dynamic Analysis of Composite Rotors" International Journal of Rotating Machinery, Vol2, No. 3(1996) pp. 179-186.
7. K.Gupta and S.P.Singh , "Damping Measurements in Fibre Reinforced Composite Shafts" Journal of Sound and Vibration , Vol. 211 No. 3 (1998) pp. 513-520.

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To be used as a guideline only.**

**This is a sample proposal to DST, Govt. of India.
To be used as a guideline only.**

8. Rakesh Chandra, S.P.Singh and K. Gupta, "Damping Studies in fiber reinforced Composites – a review" Composite Structures, Vol.46 (1999) pp. 41-51.
9. H.B.H. Gubran , S.P.Singh and K. Gupta, "Stresses in Composite Shafts subjected to Unbalance excitation and Transmitted Torque, International Journal of Rotating Machinery, 2000.
10. Rakesh Chandra, S.P. Singh and K. Gupta, " Role of interface on Damping Predictions for Three Phase Composites" To appear in Defence Science Journal.
11. Rakesh Chandra, S.P. Singh and K. Gupta, " Micromechanical Damping Models for fiber reinforced composites : A comparative Study" Composites Part A Vol 33 No.6 , pp. 787-796, June 2002..

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12. S.P.Singh and K. Gupta, "Modal Testing of Tubular Composite Shafts" Proceedings of International Modal Analysis Conference, Florida (USA) , 1993 , pp.733-739.
13. S.P.Singh and K. Gupta, "Dynamic Analysis of Composite Rotors", Proceedings of 5th International Symposium on Rotating Machinery (ISROMAC-5) Hawai (1994).
14. H.B.H. Gubran , S.P.Singh and K. Gupta, "Stresses in Composite Shafts subjected to Unbalance excitation and Transmitted Torque", Proceedings of 7th International Symposium on Rotating Machinery (ISROMAC-7) 22-26 Feb, 1998, Honolulu, USA pp. 96-105.
15. Harpreet Singh and S.P.Singh, " Active Vibration Control of a Beam Using Virtual Instrumentation Software" International Conference on Smart Materials , Structures And Systems , 7-10 July,1999, Indian Institute of Science, Bangalore.
16. S.P. Singh, "Development of Fibre Reinforced Composite Shafts", Proceedings of 5th Japan India Seminar on Manufacturing Science of Advanced Composite Materials, Institute of Industrial Science, University of Tokyo, October 19-24, 1998.
17. R. Mathan, S.K.Saha and S.P.Singh, "Behaviour of Robot Links made of Fiber Reinforced Composite Materials", Pioneering International Symposium on MOVIC in Mechatronics, Tokyo, April 6-7, 1999.
18. S.P.Singh and K. Gupta, "Experimental Studies on Composite Shafts" Presented at International Conference on Advances in Mechanical Engineering, Dec 20-22, 1995, IISc, Bangalore, pp. 1205-1220.
19. S.P.Singh and K. Gupta, "Dynamics of Composite Rotors", INDO-US Symposium on Emerging Trends in Vibrations and Noise Engineering, 18-20 March 1996, IIT, Delhi.
20. Kadre, K. Gupta and S.P.Singh "Design Alternatives for Composite Material Driveshafts, Proceedings of National Symposium on Developments in Advanced Composites and Structures, DRDL, Hyderabad, 1994, pp. 17-24.
21. S.P.Singh and A.K. Kishore "Damping Based Design with Composite Materials" , IUTAM-IITD International Winter School on Optimum Dynamic Design using Modal Testing and Structural Dynamic Modification, 15-19 Dec, 1997 pp. 445-453.

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22. Harpreet Singh , S.P.Singh and V.P. Agrawal “ Active Vibration Control using Virtual Instrumentation Software” , Proceedings of the 11th ISME Conference on Mechanical Engineering on Trends in Mechanical Engineering Education & Research , 3 – 5 Feb, 1999 pp. 112-117.
23. Rakesh Chandra , S.P.Singh and K.Gupta “ Comparative Study of Damping Models for Fibre Reinforced Composites”, Proceedings of the 11th ISME Conference on Mechanical Engineering on Trends in Mechanical Engineering Education & Research , 3 – 5 Feb, 1999 pp. 489-494.
24. Umesh M . Kalokhe, S.P.Singh and Atul Bhaskar “ Identification of damping from transient response ” Presented at 11th ISME Conference on Mechanical Engineering on Trends in Mechanical Engineering Education & Research , 3 – 5 Feb, 1999 .
25. Rakesh Chandra , S.P.Singh and K.Gupta “FEM Model for evaluation of fiber – reinforced composites” National Symposium on Dynamics , FEA in Industry-Recent Trends, IIT, Madras, Aug 7, 1998 pp. 109-114.
26. Harpreet Singh, S.P. Singh and V.P. Agarwal, “Efficient Modal Control of Vibrations” presented at INDO-US symposium on Recent Trends in Vibrations and Noise (INDUSVAN), Ohio State University Dec 8-14, 2001.
27. K. Kannan, S. P. Singh and K. K. Pujara, “Noise control in a rectangular duct using Active Structural Panel” to be presented in International Symposium of Smart Materials and Structures, Proceedings of ISSS-SPIE-2002, IISc Bangalore, July 17-19, 2002.
28. Manu Sharma, S. P. Singh and B. L. Sachdeva. Fuzzy logic based active vibration control of beams using piezoelectric patches. to be presented in International Symposium of Smart Materials and Structures, Proceedings of ISSS-SPIE-2002, IISc Bangalore, July 17-19, 2002.

List of Projects implemented

Sponsoring Agency	Project Name	Status	Investigators	Amount (Lakhs)
IRD	Fabrication and Analysis of Composite Structural Elements	Completed	S.P. Singh*	0.50
ARDB	Dynamics of High Speed Rotating Composite Shafts	Completed	K.Gupta*, S.P.Singh	15.00
ISRO	Rotordynamic Performance Analysis of Cryogenic Engine Turbopump-Unbalance Response, Stability and Transient Response	Pending	K.Gupta*, B.C. Nakra, Om Prakash, S.P. Singh	5.00
NRB	Design and Development of Composite Ship Propulsion Shaft	Ongoing	K.Gupta*, S.P.Singh	14.68
MHRD	Active Vibration Control of Structures using Piezoelectric Materials	Ongoing	S.P. Singh*, K.Gupta	6.00

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DST	Passive and Active Control of Vibration and Noise in Machine and Structures	Ongoing	K.Gupta*, B.C. Nakra, T.K. Kundra, S.P. Singh, N. Tondon	62.00
DST	Vibration Control by use of active constrained layer damping	Ongoing	S.P. Singh*	8.00
Consultancy Projects				
Client Agency	Project Name	Status	Investigators	Amount (Lakhs)
AFL Gurgaon	Analysis Vibration Severity and its effects thereof at AFL Gurgaon	Completed	S.P. Singh*, A.K. Nagpal	1.50
Carrier Aircon Ltd.	Noise reduction in 1 Ton Window Room Air Conditioner	Pending	S.P. Singh, N.Bhatnagar*	1.00
Premium Moldings and Castings	Measurement of Natural Frequencies and Polar Inertia of Steering Wheel	Completed	S.P. Singh*, K. Gupta	0.09
Boremann India, Ltd.	Calibration of a Vibration Meter and Sound Level Meter	Completed	S.P. Singh*, K. Gupta	0.07
Sherman International (P) Ltd.	Vibration Analysis and Calibration of Siesmoprobes	Completed	K.Gupta*, S.P.Singh	0.12
Sherman International (P) Ltd.	Vibration Analysis and Calibration of Siesmoprobes	Completed	S.P. Singh*, K.Gupta	0.06
Sherman International (P) Ltd.	Vibration analysis and Calibration of Snapshot Pens Instrument and Siesmoprobes	Completed	S.P. Singh*, K. Gupta	0.12
Burma Electro Corporation	Resonance Frequency Test on Dampers for Zebra ACSR	Completed	S.P. Singh*, K. Gupta	0.09
M/s Devent forms Pvt. Ltd.	Calibration of sound level meter	Completed	S.P. Singh*, N. Tondon	0.03

450. Details of Research Projects being implemented/ completed/ submitted by the Investigator

For Dr. S.K. Saha

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1. Project Title: Robot Design Using Dynamic Motion Study
Project Status: Completed

Completed-duration, period, funding agency and total cost:
1997-1999, DST (Scheme for Young Scientists), 2.05 lakhs

Summary of the project:

In this project, recursive dynamics algorithms are developed. Two C++ programs are written for the inverse (for Control)/forward (for Simulation) dynamics of serial-chain robots (Saha, 1999a).

Major Results/ Highlights of the project including achievement (publications, patents etc.):

- Two journal and two conference papers could be published;
- The C++ programs are used in the Robotics/Multibod Dynamics courses at IIT Delhi
- The above programs are made available free of cost for any academic institutions (www.angelfire.com/sc/saha)

2. Project Title: Investigation and Optimum Selection of Mechatronic Components (Co-Pis: Prof. T.K. Kundra, Dr. S. Mukherjee)

Project Status: Completed

Completed-duration, period, funding agency and total cost:
1999-2001, MHRD (Thrust Area Project), 8.0 lakhs

Summary of the project:

In this project, two major facilities, namely, an AC servo controlled XY table and an intelligent conveyor system, are developed. The simulation studies of the above two systems and their experimental verifications were carried out.

Major Results/ Highlights of the project including achievement (publications, patents etc.):

- Two M. Tech theses
- One conference paper

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Principal
Anurag Engineering College
Anantpur (AP), India

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3. Project Title: Data Base and Software Development for an Automatic Rack-bar Straightening Machine (Co-PI: Dr. I.N. Kar, Dr. K. Momaya)

Project Status: Completed

Completed-duration, period, funding agency and total cost:
2000-2001, Sona Koyo Steering Systems (P) Ltd., 2.12 lakhs

Summary of the project:

In this project, a controlling strategy for the rack-bar straightening operation is proposed based on the existing straightening process.

Major Results/ Highlights of the project including achievement (publications, patents etc.):

- A fuzzy logic based control algorithm is suggested to the company;
- An international conference paper is published in 2001.

4. Project Title: Modeling and Simulation Tools for Shape Realizability of Machined Components (PI: Dr. PVM Rao)

Project Status: Ongoing

Completed-duration, period, funding agency and total cost:
Started March 1999 (expected to be completed in Dec. 2002), Dept. of Information Technology, 33.12 lakhs

Summary of the project:

In this project, an algorithm is developed from a set of measurements to identify the errors introduced to an used CNC machine tools.

Major Results/ Highlights of the project including achievement (publications, patents etc.):

- An artifact is designed to capture the kinematics errors of a CNC machine tool
- CaliNC software for the error identification and CNC program modification to improve the accuracy of the job

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5. Project Title: Technological Improvement of Tools and Processes used by craftsman in Indian Carpet Industry (PI: Prof. R. Prasad)

Project Status: Ongoing

Completed-duration, period, funding agency and total cost:
Started March 2000 (expected to be completed in Oct. 2002),
Development Commissioner (Handicrafts), 10.12 lakhs

Summary of the project:

In this project, several tools, e.g., carpet loom, washing machines, etc. were developed for the carpet industries.

Major Results/ Highlights of the project including achievement (publications, patents etc.):

- New designs for a) Carpet Loom; b) Washing Machine; c) Squeezing machine

The above machines are now under field trials at Bhadohi, Jaipur and Agra.

450. Details of Research Projects being implemented/ completed/ submitted by the Investigator(s)/Co-Investigators including Investigator(s) Name & Institute

Project Title

Project Status:

Completed-duration, period (from.... to.....), funding agency and total cost

**On-going-duration, date of start, funding agency and total cost
proposed-duration, funding agency where submitted and total cost**

Summary of the project

Major Results/ Highlights of the project including achievement (publications, patents etc.), for completed projects

Up-to date Technical progress report for on-going projects.

For Dr. S.P. Singh, Please see the projects implements in 430

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Ananthapur (A&M) Kodad.

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500. Any other relevant matter. *NIL*

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File No** _____

1. Title: *Study and Analyses of Light Weight, High
Speed Robot Arms*

2. Proposed Budget for 3 years:

2.1 Total: 19.0 lakhs

2.2 Equipment: 3.8 lakhs
**(Please give list of major/
minor equipment)**

AC Servo Motors (2)
2-axes Controller card
Data Acquisition System
PC based Controller Interface

2.3 Staff (proposed research staff): 9,46,800 (RA, JRF,
Attendent)

2.4 Other Recurring costs:

Consumable: 60,000

Travel: 75,000

Contingency: 30,000

Any other expenses: 4,08,200

3. Date of receipt :**

4. PI Name, Designation & Address:

Dr. S.K. Saha, Associate Professor, Mech. Eng.
Dept., IIT Delhi, Hauz Khas, New Delhi 110 016

5. Date of Birth: Sept. 02, 1961

6. Co-Investigator(s) details:

Dr. S.P. Singh, Associate Professor, Mech. Eng. Dept., IIT
Delhi, Hauz Khas, New Delhi 110 016

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7. Date of Birth(s): Jan 20, 1968

8. Other projects with the PI/Co-PI(s) :

Sr. No.	Title	Cost (in rupees)	Duration	Agency
For Dr. S.K. Saha				
1	Robot Design Using Dynamic Motion Study (Completed)	2.05 lakhs	2 years	DST (SYS)
2	Investigation and Optimum Selection of Mechatronic Components (Completed)	8.0 lakhs	2 years	MHRD (Thrust Area)
3	Data Base and Software Development for an Automatic Rack-bar Straightening Machine (Completed)	2.12 lakhs	7months	Sona Koyo Steering Systems
4	Modeling and Simulation Tools for Shape Realizability of Machined Components	33.12 lakhs	3 years	DIT
5	Technological Improvement of Tools and Processes used by craftsman in Indian Carpet Industry (On-going)	10.12 lakhs	18 months	DC (Handicrafts)
For Dr. S.P. Singh (Only On-going sponsored projects)				
1	Design and Development of Composite Ship Propulsion Shaft	14.68 lakhs	2 years	NRB
2	Active Vibration Control of Structures using Piezoelectric Materials	6.0 lakhs	3 years	MHRD
3	Passive and Active Control of Vibration and Noise in Machine and Structures	62.0 lakhs	3 years	DST
4	Vibration Control by use of active constrained layer damping	8.0 lakhs	2 years	DST

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Annexure

**List of Programme Advisory Committees (existing)
(Please enter one of these at Section 104: Sub Area)**

Chemical Sciences (3 PACs)

- i) Inorganic Chemistry
- ii) Organic Chemistry
- iii) Physical Chemistry

Earth & Atmospheric Sciences (2 PACs)

- i) Atmospheric Science
- ii) Earth Science

Engineering Sciences (5 PACs)

- i) Chemical Engineering
- ii) Electrical, Electronics and Computer Engineering
- iii) Materials, Mining and Mineral Engineering
- iv) Mechanical Engineering and Civil Engineering
- v) Robotics and Manufacturing

Life Sciences (4 PACs)

- i) Animal Sciences
- ii) Biophysics, Biochemistry and Molecular Biology
- iii) Health Sciences
- iv) Plant Sciences

Mathematical Science (1 PAC)

Physical Sciences (3 PACs)

- i) Condensed Matter Physics and Materials Science
- ii) Lasers, Optics, Atomic and Molecular Physics
- iii) Plasma, High Energy, Nuclear Physics,

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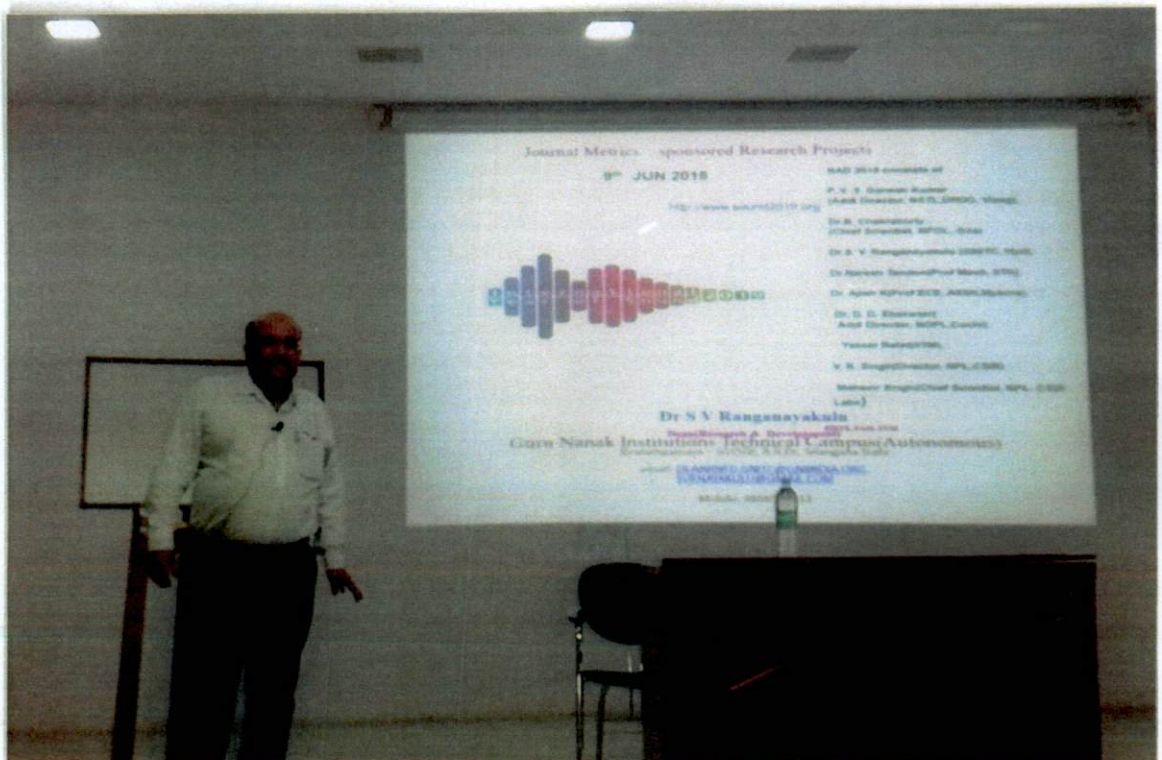
**Astronomy & Astrophysics and Nonlinear
dynamics**

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09 - 06 - 18



Ranga Naya Kuru addressing the faculty



Principal
Anurag Engineering College
Ananthagiri (V&M), Kodad,
District (Dt) Telangana-508206

నాయకులు, అధికారులు

దారు. స్థానిక పెద్దమనుషులలో డీఎస్సీ సుదర్శన్ రెడ్డి, ఆర్టీవో బిక్షానాయక్, తహసీల్దార్ శ్రీదేవి, సీఐ శ్రీనివాసులు రెడ్డి, నాయకులు ప్రత్యేక ప్రార్థనలు నిర్వహించారు. అనంతరం షాదీముబారక్, కల్యాణలక్ష్మి చెక్కులను అందించారు. కార్యక్రమంలో తెరాస నాయకులు ముత్తవరపు పాండు రంగా రావు, కేఎల్ఎన్ ప్రసాద్, ఎస్.కె.నయ్యామ్, వీరా రెడ్డి, ఈదుల కృష్ణయ్య, బాబాగౌడ్, బాపమియా, ఎంపీపీ నాగేంద్రబాబు, గరిజె కోటేశ్వరరావు, వార్డు కౌన్సిలర్లు, ప్రభుత్వ అధికారులు ముఖ్యం సోదరులు పాల్గొన్నారు.

దరఖాస్తు చేసుకునేలా చూడాలి

నల్గొండ విద్యావిభాగం, న్యూస్టుడె: డా.బి.ఆర్.అంబేద్కర్ ఓపెన్ యూనివర్సిటీ ఆధ్వర్యంలో ఎలాంటి విద్యార్హత లేనివారికి నిర్వహించే ప్రత్యేక అర్హత పరీక్షకు ఎక్కువ మంది అభ్యర్థులు దరఖాస్తు చేసుకునేలా చూడాలని ఆ యూనివర్సిటీ రిజిస్ట్రార్ ప్రొఫెసర్ సి.వెంకటయ్య కోరారు. శనివారం నల్గొండలోని అంబేద్కర్ ఓపెన్ యూనివర్సిటీ నల్గొండ రీజనల్ కో-ఆర్డినేషన్ సెంటర్ సమావేశమందిరంలో ఉమ్మడి జిల్లా అసిస్టెంట్ డైరెక్టర్ డా.బి.ధర్మానాయక్ అధ్యక్షతన కౌన్సిలర్ల సమావేశం నిర్వహించారు. ఈ సమావేశంలో రిజిస్ట్రార్ టెలికాన్ఫరెన్స్ ద్వారా కౌన్సిలర్లను ద్వైశింది మాట్లాడారు. రాష్ట్రంలోనే యూనివర్సిటీ ప్రథమస్థానంలో ఉండేవిధంగా కృషి చేయాలన్నారు. ఈ నెల 24న రాష్ట్రవేట, కోదాడ, నల్గొండ కేంద్రాలలో పరీక్షలు జరుగుతాయన్నారు. ధర్మానాయక్ మాట్లాడుతూ ఎలాంటి విద్యార్హత లేనివారు అర్హత పరీక్ష రాస్తే డిగ్రీలో ప్రవేశం పొందవచ్చని వివరించారు. ఆదివారం ఉదయం 10.30కు బీకాడీ ప్రవేశపరీక్ష మధ్యాహ్నం 2గంటలకు నైట్ల బీకాడీ పరీక్ష నిర్వహించడం జరుగుతుందని చెప్పారు. కార్యక్రమంలో ఎస్సీ కళాశాల అధ్యాపకులు నందకుమార్, సిబ్బంది రెక్కానాయక్, మహేష్ పాల్గొన్నారు.



మాట్లాడుతున్న ఉమ్మడి జిల్లా ప్రాంతీయ సమన్వయకర్త డా.బి.ధర్మానాయక్

కార్యదర్శి బీవీ జిల్లా అధ్యక్షుడు అంజన్ రెడ్డి అన్నారు. స్థానిక ఎమ్మార్సీ భవనంలో రాష్ట్రోపాధ్యాయ సంఘం(ఎస్టీఆర్) ఆవిర్భావ దినోత్సవాన్ని శనివారం నిర్వహించారు. జెండ్రాసు జిల్లా అధ్యక్షుడు అంజన్ రెడ్డి ఆవిష్కరించి, మాట్లాడారు. అప్పటి నైజాం నిరం కుశ పోకడలకు ఉపాధ్యాయుల సాధనకు మగ్గుమ్ మొహినోద్దీన్ అధ్యక్షతన సంఘం ఆవిష్కరించారన్నారు. కార్యక్రమంలో ఎంఈవో గోపతి గోపయ్య, సీనియర్ నాయకులు శిట్టి వెంక



ఎస్టీఆర్ జెండ్రాసు ఆవిష్కరించిన రాష్ట్ర జిల్లా నాయకులు

టేశ్వర్లు, కోదాడ మండల అధ్యక్ష కార్యదర్శులు బి.రుష్మానాయక్, బి.లోకేశ్, జిల్లా కార్యవర్గ సభ్యులు చందూలాల్, బీఆర్సీ రెడ్డి, మదనాచారి, పురుషోత్తమరావు, పూర్ణచందర్ రావు, సురేష్, వీరేంద్రవర్మ, శ్రీను తదితరులు పాల్గొన్నారు.

'అనురాగ్'లో ఫ్యాకల్టీ డెవలప్ మెంట్ సదస్సు

కోదాడ రూరల్, న్యూస్టుడె: కోదాడ అనురాగ్ ఇంజనీరింగ్ కళాశాలలో ఫ్యాకల్టీ డెవలప్ మెంట్ సదస్సు నిర్వహించారు. మూడ్రోజుల పాటు నిర్వహిస్తున్న సదస్సులో పలువురు నిపుణులు హాజరై అధ్యాపకులకు శిక్షణ ఇచ్చారు. హైదరాబాదుకు చెందిన ఎస్వీ రంగనాయకులు మాట్లాడుతూ జాతీయ, అంతర్జాతీయ పరిశోధనా పత్రాలు ఏ విధంగా రూపొందించాలి, పరిశోధనకు కావాల్సిన వనరులను సమకూర్చేందుకు సహాయపడే వివిధ రకాల సంస్థలు, ఏపీసీఈ, యూఈసీ, డీఆర్డీవో, వివిధ రకాల సంస్థల



హాజరైన అధ్యాపకులు

ద్వారా సహాయాలను ఎలా పొందాలో వివరించారు. కళాశాల ప్రిన్సిపల్ ఎం.వి.శివప్రసాద్, వివిధ విభాగాల అధ్యాపకులు హాజరయ్యారు.

ప్రభుత్వ పాఠశాలల్లో మౌలిక సదుపాయాలు కల్పించాలి

కోదాడ పట్టణం, న్యూస్టుడె: తెలంగాణ బీసీ యువజన సంఘం ఆధ్వర్యంలో స్థానిక మేకల అబినవ్ ఆడిటోరియంలో ప్రభుత్వ పాఠశాలలో పదో తరగతిలో ప్రథమ, ద్వితీయ స్థానాలు సాధించిన విద్యార్థులకు సన్మాన కార్యక్రమం ఏర్పాటు చేశారు. సంఘం రాష్ట్ర అధ్యక్షుడు మల్లెబోయిన అంజియా దవ్, ఆర్టీవో బిక్షానాయక్ శనివారం కోదాడ, అనంతగిరి, విలుకూరు మండలాలకు చెందిన విద్యార్థులకు బహుమతులు అందించి, సన్మానం చేశారు. అంజి మాట్లాడుతూ హైదరాబాద్ రాజభవన్ పాఠశాలను ఏ విధంగా అభివృద్ధి చేశారో అన్ని ప్రభుత్వ పాఠశాలల్లో మౌలిక సదుపాయాలు కల్పించాలన్నారు. ప్రతి నియోజకవర్గానికి బీసీ గురుకులాలను ఏర్పాటు చేయాలన్నారు. ప్రభుత్వ పాఠశాలలకు రూ.వెయ్యి కోట్లు బడ్జెట్ కేటాయించాలని ప్రభుత్వాన్ని డిమాండ్ చేశారు. కార్యక్రమంలో ఎంపీపీవో ప్రేమకరణ్ రెడ్డి, తహసీల్దార్ శ్రీదేవి, పట్టణ, గ్రామీణ సీఎలు శ్రీనివాసులు రెడ్డి, రవిచంద్ర, ఎస్సీ, ఎస్టీ, బీసీ, మైనార్టీ ఐక్య వేదిక అధ్యక్షుడు పంది తిరుపతయ్య, కల్యాణ్, విశ్వజ్ఞాచారి, ఎం.వెంకటేశ్వరదాస్, భాస్కర్, రాజశేఖర్, సాయి, ఉపేందర్, కమలాకర్, పాఠశాలల ప్రిన్సిపల్స్ తదితరులు పాల్గొన్నారు.

కోదాడ పట్టణం, న్యూస్టుడె: గతంలో మాదిరిగానే ఉపాధ్యాయుల బదిలీలో డీఆర్పీలకు ప్రత్యేక పాయింట్లు కేటాయించాలని డీఆర్పీల సంఘం అడవాక్ కమిటీ జిల్లా అధ్యక్షుడు ఎం.హమీద్ ప్రభుత్వాన్ని కోరారు. శనివారం ఆయన కోదాడలో మాట్లాడుతూ విద్యాశాఖ పథకాలను కిందిస్థాయిలో అమలు చేయడానికి ఉపాధ్యాయులకు, విద్యాశాఖాధికారులకు అనుసంధానంగా ఉన్న డీఆర్పీలకు బదిలీలో పాయింట్లు కేటాయించకపోవడం అన్యాయమన్నారు. జిల్లా కేంద్రంలో పలుమార్లు నిర్వహించిన శిక్షణలో స్వచ్ఛుదంగా పాల్గొని విద్యా ప్రణాళిక కార్యచరణ అమలులో కీలకపాత్ర పోషించారన్నారు. ప్రభుత్వం పునరాలోచించి డీఆర్పీలకు బదిలీ కౌన్సిలింగ్లో పాయింట్లు కేటాయించాలని విజ్ఞప్తి చేశారు.



విద్యార్థులను సన్మానించి, బహుమతులు అందజేస్తున్న సంస్థ అధ్యక్షుడు మల్లెబోయిన అంజియా దవ్, ఆర్టీవో బిక్షానాయక్

Principal
Anurag Engineering College
Ananthagiri (V&M), Kodad,
Suryapet (Dt.), Telangana-508206



ANURAG Engineering College

(Approved By AICTE, Permanently Affiliated to JNTU(H), Hyderabad & Accredited by NBA)

An Autonomous Institution

Ananthagiri(V&M), Suryapet(Dist.), Telangana.

Date: 03.04.2019

CIRCULAR

All the Department of CSE Faculty members are here by informed that a one day faculty development program on “Transforming Education with Microsoft Technologies” will be held on 04.04.2019. All the faculty members should attend and make it grand success.

List of resource persons:

S.NO	Name of the Resource Person	Date of Visit
1	Mr. N. Anil Kumar	04.04.2019

Venue: Room No. 204 (BLOCK-A)

Reporting time: 9:45 AM

PRINCIPAL

Principal
Anurag Engineering College
Ananthagiri (V&M), Kodad,
Suryapet (Dt.), Telangana-508206

1. All HoD's.
2. To be circulate among faculty members.
3. To Secretary & Correspondent file.

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Categories

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hod +

principal anurag
SEND STUDENTS DAILY ATTENDAN

Laxmi Prasanna

Workshop on Microsoft Technologies

hod cse <hod.cse@anurag.ac.in>

Dear Sir,

We are planning to conduct a Workshop on Microsoft

Slot I: 01-04-2019 & 02-04-2019

Slot II: 08-04-2019 & 09-04-2019

with warm regards
G.Srinivasa Rao
Assoc.Prof & HOD
Dept.of CSE

madhu

Dear Sir,

Please find the below mail


Principal

Anurag Engineering College
Ananthagiri (V&M), Kodad,

4/10/2019 2:45 PM

madhu Tue, Mar 19, 3:05 PM

Dear Sir,

Please find the below mail.

Regards Madhu

From: N Anil Kumar (V5 Global Services Pvt Ltd) [mailto:v-nanik@microsoft.com]

Sent: Tuesday, March 19, 2019 2:31 AM

To: madhu

Cc: Bhasker Joshi

Subject: RE: Workshop on Microsoft Technologies Reg..

You can confirm for 1.04.2019.

One day is more than sufficient for office 365 apps demo.

I will be requiring :

Projector and screen

Microphone

internet connection.

N Anil Kumar

AIPDM – Microsoft Education Team

9052230245



Principal
Anurag Engineering College
Ananthaciri (V&M), Kodad



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
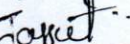
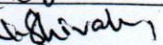




CSE

2018-19

A Faculty Development Programme on
"Transforming Education with Microsoft Technologies"
On 04-04-2019 at 9:45 am at A-204.

S.NO	NAME	DESIGNATION	SIGNATURE
1	Dr.M.V.Siva Prasad	Professor	
2	Dr.M. Murugesan	Professor	
3	Dr.B.Srinivas Rao	Professor	
4	G.Srinivasa Rao	Assistant Professor	
5	G V S Ch S L V Prasad	Assistant Professor	
6	Y V R Naga Pawan	Assistant Professor	
7	CH Krishna Prasad	Assistant Professor	
8	P Guru Lingam	Assistant Professor	-NA-
9	P Sandeep Reddy	Assistant Professor	
10	P Niranjan Kumar	Assistant Professor	
11	K Vijay Kumar	Assistant Professor	
12	K Naresh Kumar	Assistant Professor	
13	Y Bharath Bhushan	Assistant Professor	
14	J Naga Raju	Assistant Professor	
15	A Naresh Kumar	Assistant Professor	
16	Y Laxmi Prasanna	Assistant Professor	
17	M Shailaja	Assistant Professor	
18	J Vijayasree	Assistant Professor	
19	S Saritha	Assistant Professor	
20	N Mownika	Assistant Professor	
21	T Aruna	Assistant Professor	
22	G L N V Kartheek	Assistant Professor	
23	V Surya Pawan	Assistant Professor	
24	N Ashok	Assistant Professor	
25	G Subhadra	Assistant Professor	
26	N Mahesh Babu	Assistant Professor	
27	CH Venkata Navi	Assistant Professor	

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28	K Upendar Rao	Assistant Professor	
29	Md Ayub Khan	Assistant Professor	
30	CH Anjaiah	Assistant Professor	
31	P Vishnu Vardhan	Assistant Professor	
32	B Lalitha Bhai	Assistant Professor	
33	V Jaswanthi	Assistant Professor	
34	N Siva Kumar	Assistant Professor	
35	P Mahesh Goud	Assistant Professor	
36	S Rajeswari	Assistant Professor	- NA -
37	D V Girish	Assistant Professor	
38	M Navya	Assistant Professor	
39	P Hema Sai	Assistant Professor	
40	P Nikhitha	Assistant Professor	- NA -

A ONE DAY FDP ON

TRANSFORMING EDUCATION WITH MICROSOFT CLOUD TECHNOLOGIES


BY

Mr. N. ANIL KUMAR
(ACADEMIC PARTNER DEVELOPMENT MANAGER)
HYDERABAD

Date : **04 - 04 - 2019** Venue : **A - 204**

Organized by :

Department of COMPUTER SCIENCE & ENGINEERING

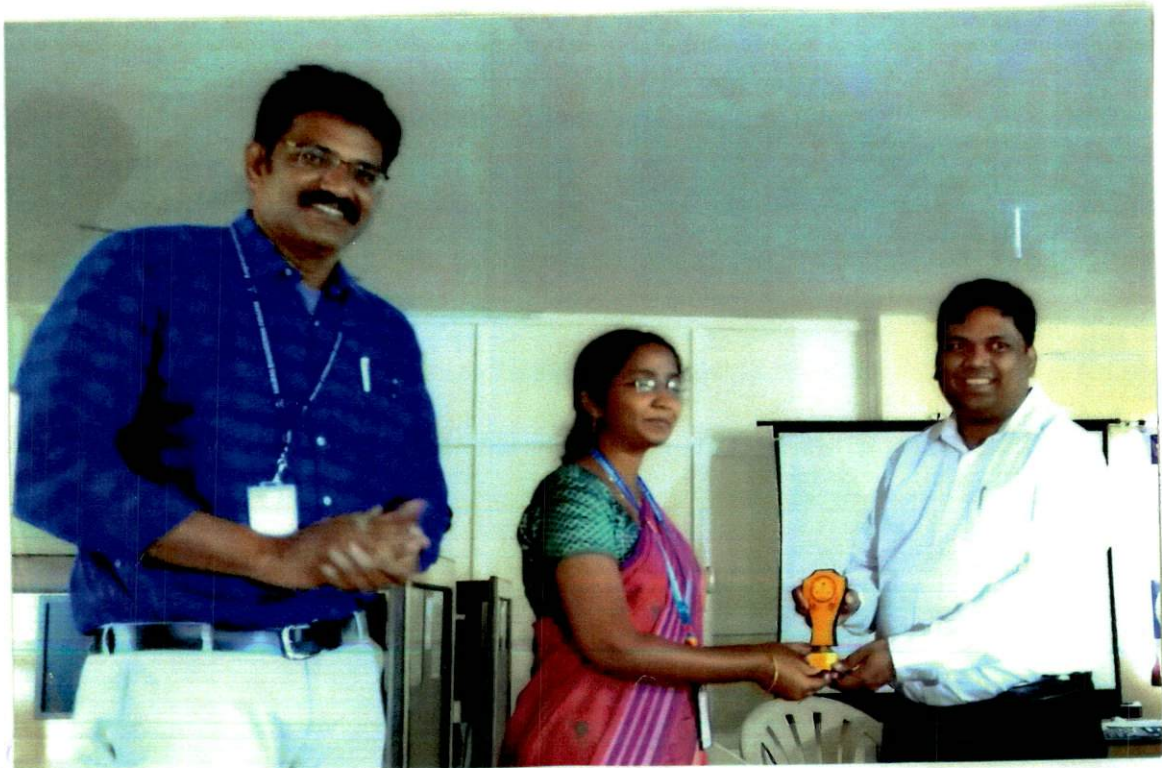
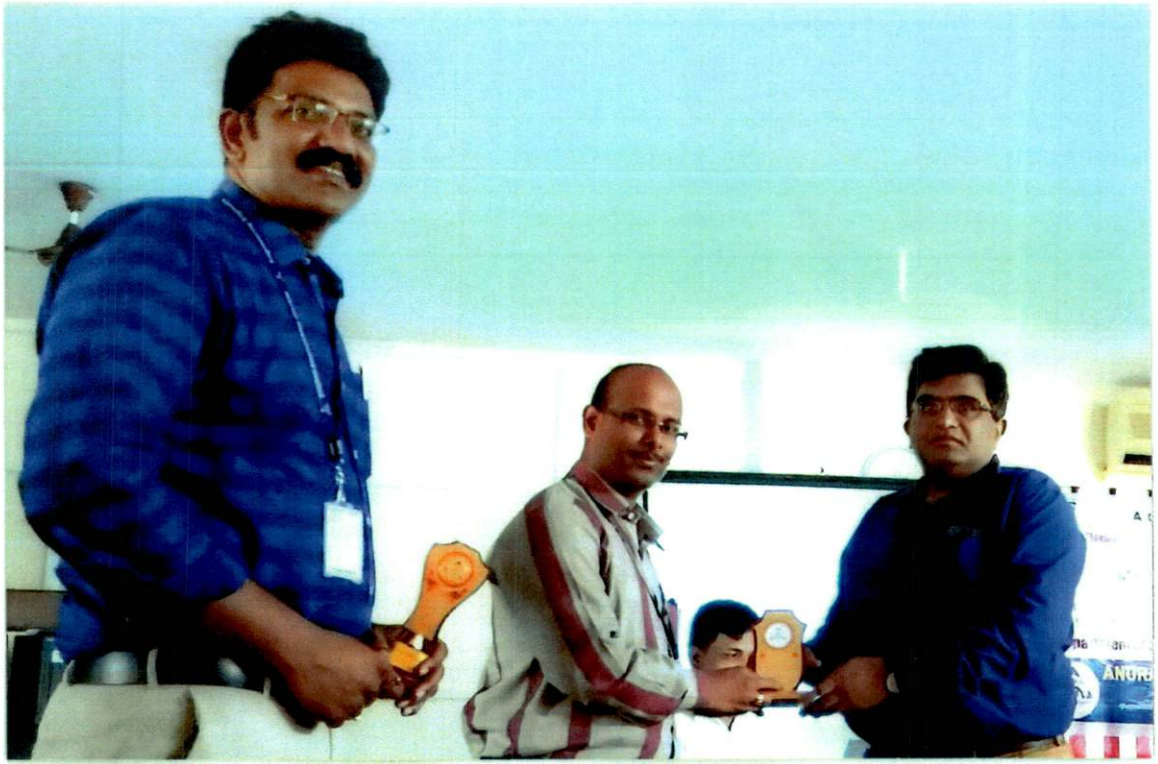


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