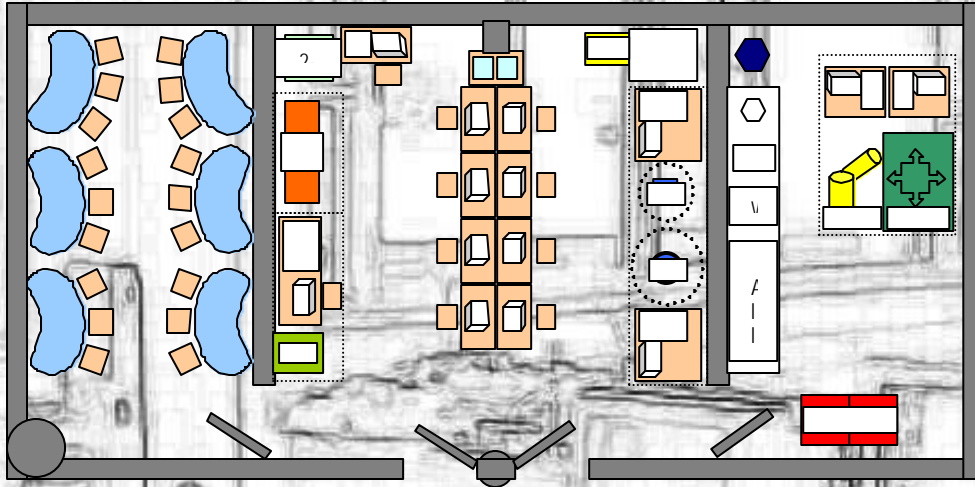


Central Zones of Mechatronics Laboratory



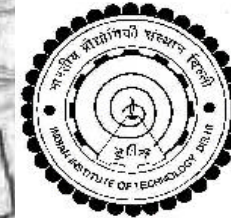
Lab. Responsibilities

The following responsibilities are shared by the faculty in-charge, technical staff, all students and project staff working in this lab.:

1. Safety and First Aid aspects
2. Cleanliness and Beautification
3. Computer Hardware and Software maintenance
4. All robots operations and maintenance
5. XY Table and the Intelligent Conveyor System operation and maintenance
6. Tools classification and maintenance
7. Documentation classification
8. Tea corner

Mechatronics Laboratory

3rd Annual Report
(July 2003-November 2004)



Block II, Room No. 420
Department of Mechanical Engineering
IIT Delhi, Hauz Khas
New Delhi 110 016
INDIA

Preface

Mechatronics Laboratory is proud to be in its 4th year of existence since its establishment in July 2001. During 2003-2004, the lab. coordinated the activities of the 11th National Conference on Machines and Mechanisms (NaCoMM 2003) held during Dec. 18-19, 2003, which was organized by the Department of Mechanical Engineering. Around 200 people participated, from seven countries, Japan, USA, Canada, The Netherlands, Sweden, Sri Lanka, and India. The lab. pictures were used in the covering page of the conference proceedings. Two Ph. D students of the lab., Mr. P.P. Bhangale and Mr. N. Kamble have designed the cover page.

Besides, the lab. supported the students participating in the Doordarshan-Robocon competitions held in NIT, Ahmedabad during July 2003. The whole competition was aired in the DD-National channel after one week of the event. The IIT Delhi team stood third.

Finally, the lab. is proud to announce the addition of books on Mechatronics, Mechanical Design, and others in its already existing library section where catalogues, pamphlets, brochures of different products received from the suppliers are kept in a systematic manner for easy referencing.

Acknowledgements

The lab. acknowledges the continuous support of the department without which it could not reach where it is today. We also acknowledge the contributions and support given by the faculty, staff, ex-Ph. D/M. Tech/B. Tech students, ex-project staff, and the present students of the department who helped us to maintain the lab. software, hardware equipment, and other items.

Mechatronics Lab Team

7. Lab Seminar/Presentations

Mr. P.P. Bhangale: June, Oct., 2003; Feb. 2004
Mr. N. Kamble: Aug. 2003, May, June 2004
Mr. A. B. K. Rao: Sept. 2003, Jan., Feb., 2004
Mr. Ashish Mohan: Sept., Dec., 2003

8. Documentation

The following new brochure, reports were prepared during the last one year:

- Mechatronics Laboratory Brochure (updated)
- Mechatronics Laboratory Annual Report (2002-2003)

9. Faculty

Faculty from different departments/centers of the institute have used the lab facilities during July 2003-August 2004 in the form of supervising student projects or using for the practical classes of their courses. The participating Departments/Centres are:

- Mechanical Engineering Department
- Electrical Engineering
- IDDC (Centre)

For further details, please contact:

The Head/Dr. S.K. Saha
Department of Mechanical Engineering
IIT Delhi, Hauz Khas, New Delhi 110 016, INDIA
Tel: +91-11-2659 6139/1135/6320; Fax: 2658 2053
Email: saha@mech.iitd.ernet.in

5. Achievements

- Article appeared in “Eklavya Channel highlights,” Oct-Dec, 2003
- Supported the IIT Delhi student team for the Doordarshan ROBOCON 2003 and 2004 competitions held in July, 2003 and 2004, respectively. Both time, the teams stood third.
- Best Paper Award in SAE-SIS Conference, Chennai, Nov. 2003

Paper Presentations

- (Abroad) On “Robot Architecture Selection,” Ph. D student, July 2003, ECCOMAS Multibody Dynamics Conference, Lisbon, Portugal
- (Abroad) On “Workspace of Hexaslide Machine Tools,” Ph. D student, Sept 2003, IEEE Conf on Robotics and Automation 2003, Taipei, Taiwan
- On “Robot Architecture Selection Criterion,” Ph. D student, Oct. 2003, TENCON- IEEE Regional Conf, Bangalore
- On “Steering System Modeling,” Ph. D student (Best Paper Award), Chennai, Nov. 2003
- On “Dynamic Model of Hexaslides,” Ph. D student, NaCoMM-2003, IIT Delhi, Dec. 2003
- On “Robot Attributes,” Ph. D student, NaCoMM-2003, IIT Delhi, Dec. 2003
- On “Hexaslide Stiffness,” Ph. D student Nat. Conf. on Adv. Manuf., CMERI, Durgapur, Jan. 2004
- On “Flexible Robotics,” Ph. D student Nat. Conf. on Adv. Manuf., CMERI, Durgapur, Jan. 2004
- On “Steering Systems,” Ph. D student, SAE Mobility Conference, New Delhi, Jan. 2004

6. Events

- July 2003: Lab. class for the participants of NSIT short-term course
- Sept. 02, 2003: Visit by German Science Councilor
- Sept. 14, 2003: Participated in the Institute Open House
- Sept., 2003: Visit by the participants of IEEE workshop in EE Dept.
- Nov. 06, 2003: 1) Visit by NSIT students; 2) Live demonstration during ROBOTechs 2004 workshop
- Dec. 24, 2003: Visit by the 1979 alumni

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Lab at a Glance during 2003-2004

Facilities

Hardware: 8 (+1)*; Computers: 12 (+2); Software: 11 (+1)

Practical Classes

Total: 8 [5 UG (+3) + 3 PG (+1)]

Student Projects Completed

M. Tech: 3; BTP: 3 (-1); MiniP: 2 (-1)

Other Activities

Best Paper: 1; Paper Presentation: 9; Student Competition: 2

* + implies addition of an item during the last year (2003-2004).

1. Introduction

One of the major changes took place in the lab. was the partition of its physical space. There are a total of five working areas designated as Electronics and Sensor area, Computing and Hardware area, UPS and Non-AC Hardware area, Model and Library area, and Tools area in which only the first two areas are planned to be air-conditioned.

2. Lab. Facilities

Computers		Hardware		Software	
C1	SGI WS [S2,5]	H1	CNC XY Table [C5]	S1	ADAMS 12 [C2-3]
C2	COMPAQ [S1,4,8]	H2	Intelligent Conveyor [H3,C6]	S2	ADAMS 11 [C1]
C3	P-III [S1,4,8]	H3	Fiber Optic Sensor [H2]	S3	ULTRAGRIP [C4]
C4	P-I [S3,4,8]	H4	MA3000 Robot [C8]	S4	MATLAB 5.3 [C2-5]
C5	P-I [H1,S4,8]	H5	RTX Robot [C7]	S5	C, C++, F77 [C1]
C6	IBM-486 [H3,7S4,8]	H6	HaPRA Robot [C9]	S6	VC++ [C4]
C7	486-DOS [H2,5]	H7	OWI Robot [C6]	S7	BASIC [C8]
C8	286-DOS [H4]	H8	Mobile Robot [C9]	S8	MS Office [C2-6,10-12]
C9	286-DOS [H6,8,10]	H9	HEXAPOD M/C Model	S9	RIDIM [C2,10]
C10	486-Win: 6	H10	Index Table [C9]	S10	ROBOCELL [C10]
C11	P-V [S11]	H11	µP Training Kits: 5	S11	MSC-ADAMS [C203,11-12]
C12	P-V [S11]	H12	Phantom [C9]		
		H13	PPR Robot [C10]		
		H14	SCORBOT ER9 [C10]		
		H15	Drive Robot [C9]		
		H16	6-legged walker		
		H17	LEGO-MS: 6sets		
		H18	5-bar Flying Mech.		

3. Academic Courses

The lab. is being used for tutorials and practicals of the following courses:

- ME100S: Introduction to the Department, UG (Mech. and P&I)
- ME304P: Design Laboratory, UG
- ME409N: Mecharonics, UG
- ME410: Robotics, UG
- ME203N: Kinematics of Machinery, UG
- ME731N: Design of Mechanisms and Manipulators, PG
- EL749: Mechatronics Product Design, PG
- For ITMMEC students, PG

4. Student Projects

The following students who used the lab. to finish their research projects during 2003-2004:

Ph.D.

- Design and analysis of hexaslides

M. Tech

- Parallel drive robot
- Steering system modeling
- Power plant conveyor simulation

B. Tech

- Gripper design and fabrication
- AGV controller debugging
- Control of PPR robot

Mini Projects

- Measure of soft tissue properties using Phantom, PG
- Micro air vehicle, UG

Other projects

- Fabrication of bio-inspired robots
- Control of flexible robot