Center for Product Design and Realization (CPDR)

Laboratory Coordinator: Prof. Srinivasa Prakash Regalla (regalla@hyderabad.bits-pilani.ac.in)

Laboratory Technical Assistant: Mr. B. Suryanarayana

Location: E-112

CPDR is a laboratory in the Department of Mechanical Engineering and has vision to grow up to become a center of excellence in product design and realization in the form of rapid and efficient prototyping as well as rapid additive manufacturing of low-volume products with high geometric creativity. The laboratory has always been buzzing with creative activity with several PhD research, Higher Degree dissertation and First Degree thesis and large number of undergraduate project students. One UGC major research project has been completed and it has been supporting to several other funded research projects. The research papers published out of this have been displayed in the notice board of the Lab and more details of the research work are displayed as poster presentations in the Lab. The laboratory has been supporting the pedagogy of several courses including DE G531: Product Design, ME ME/MF F342: Computer Aided Design, ME G611: Computer Aided Analysis and Design, ME G512: Finite Element Methods, ME/MF F241: Machine Design & Drawing and ME F416: Reverse Engineering and Rapid Prototyping. The laboratory has also been providing prototyping services to several faculty members and students in the Department, various departments in the Institute as well as some outside organizations, thus proving to be an indispensable cog in the wheel for innovators.

The CPDR has an additive manufacturing machine for rapid prototyping, one surface roughness Profilometer for quality control studies of prototypes, grid marking machine for formability studies and several high end computer aided design and engineering software including LS-DYNA, COMSOL, ANSYS, Matlab and Design Expert. Order has been placed for a set of demonstration

working models of fundamental machine elements to support the conceptual design and product embodiment stages of in creative product design.

PhD Students:

Completed:

(1) Dr. G. Pavan Kumar, on "Mathematical Modeling, Numerical Simulation and multi-objective optimization of Fused Deposition Modeling".

Submitted:

(1) Mr. Kurra Suresh, on "Finite Element Studies and Experimental Validation of Asymmetric Incremental Sheet Forming of Extra Deep Drawing Steel".

In Progress:

(1) Ms. Swagatika Mohanty, on "Robot Assisted Incremental Sheet Metal Forming".

(2) Mr. Nasir, on "Elastic – plastic deformations in automobile crash-box".

(3) Mr. Satya Suresh, on "Experimental and Simulation Studies on Metal Forming of TWBs".

(4) Mr. Sivakumar Ramalingam, on "Condition monitoring of automatic manual transmission system for heavy trucks".

Higher Degree Dissertation Students:

Mr. Sailendu Biswal (Completed), Mr. Nithin Rayudu (Completed), Mr. Shashank Chaudhary (Completed), Mr. Jay Patel (Completed), Mr. Nikhil Tatke (Completed).

First Degree Thesis Students:

(1) Mr. Armaan Khan, (2) Mr. Sai Samir (Completed), (3) Mr. Shrinivas Kullarni (Completed), (4) Ms. Srishti Rani (Completed), (5) Mr. Ephrem Joel (Completed), (6) Mr. Sai Sudeep Dwarka (in progress).

LIST OF EQUIPMENTS:

SL No.	Equipment/Make/ Specification	Utility
1.	*Uprint* Additive Manufacturing Machine, Stratasys Inc., USA	ME/MF F342, ME G611 Education; PhD research; funded research; prototyping support to many departments in the campus
2.	Rank Taylor Hobson Computerized Surface Roughness Measuring Profilometer; Model: Surtronic.	Teaching support and PhD research support; Support to other departments.
3.	Etching type Erichsen cupping test grid marking machine; Maker: Grid-on, Delhi.	Teaching and PhD research support
4.	4-core high end DELL workstation with large display	PhD research support; Server for several softwares
5.	LS-DYNA explicit finite element software, 2 run licenses	PhD research, HDD research and FDTS support
6.	Design Expert design of experiments software	PhD research, HDD research

		and FDTS support
7.	COMSOL 4.3b Research License; one number	PhD research, HDD research and FDTS support

Research Projects:

SL No.	Project	Principal Investigator	Status	
1.	UGC major project: Rapid Asymmetrical Hybrid Incremental Forming	Prof. Srinivasa Prakash Regalla	Completed	
2.	(Support provided to) BIRAC BIG-5 Project: Affordable Prosthetics through Additive Manufacturing	Prof. Srinivasa Prakash Regalla	In progress