About the Centre

Structural Impact and Crash Simulation Centre (SIMCRASH) was established at the Hindustan Institute of Technology and Science (HITS) on 12th January 2017 to promote educational and research activities in the field of structural impact and crash analysis. The centre bridges the gap between the industries, research institutes and the University with a distinct capability to harness the intellectual energy of academia to solve the real time problems faced by the industry and the defence forces. SIMCRASH is a multi-disciplinary research centre dedicated for solving real world structural impact and crash problems through the application of modelling and simulation techniques and to develop new approaches in material modelling for structural impact crash problems.

Inauguration of SIMCRASH centre

VISION

To be a centre of excellence for design and development of structural systems for structural impact and crash related technologies

Mission

To asses, design, simulate and integrate advanced state of art technologies for impact and crash proof design of systems for industry and defence forces

Objective

- To carry out advanced interdisciplinary research in broad areas of structural impact and crash simulation.
- To generate trained man power through research and training.
- To take up sponsored and consultancy projects with specific deliverables in the area of impact, blast and crash simulation.
- To conduct outreach programmes through workshops and training programmes to disseminate knowledge in interdisciplinary areas of impact, blast and crash

Functional Domain

Focus Area

- Bird Strike simulation
- Fatigue and Fracture mechanics
- Hail ice Impact testing and simulation
- Mine Blast simulation
- Projectile Impact testing and simulation
- Space Debris impact on satellites
- Traumatic Brain Injury (TBI) simulation
- Underwater Explosion simulation
- Water Entry Shock simulation

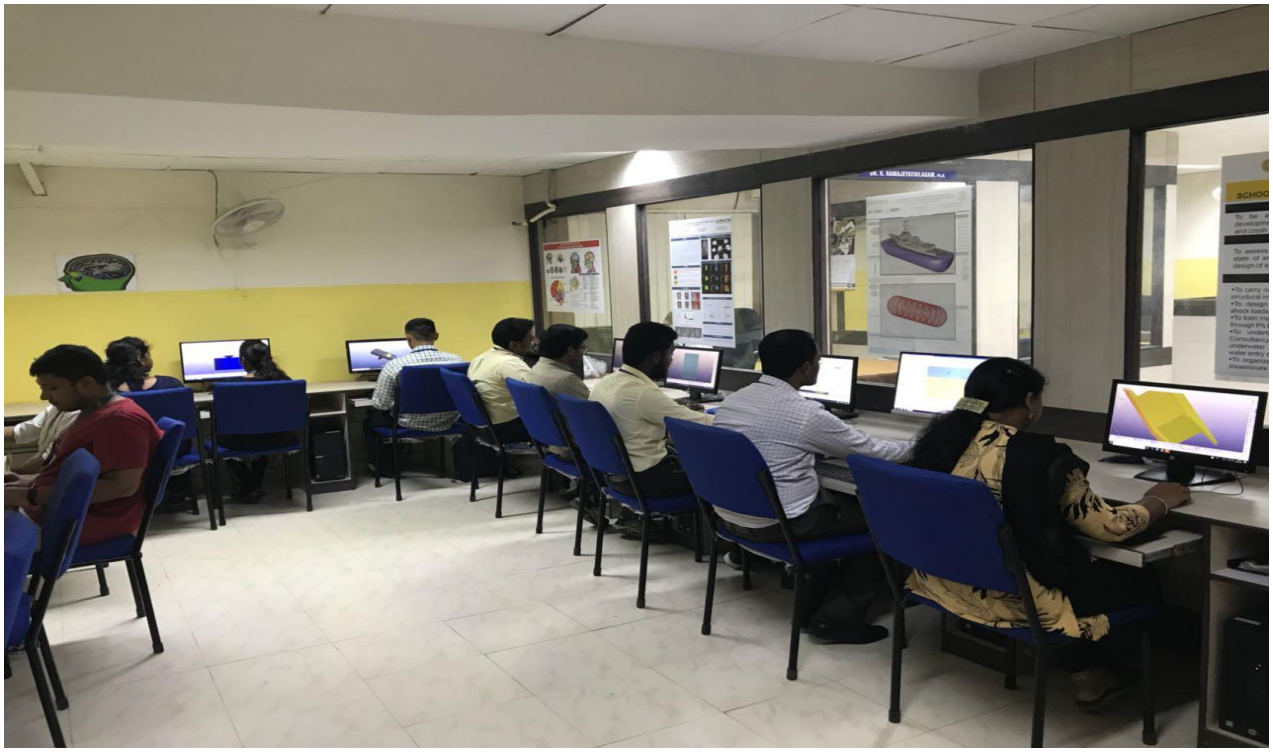
FACILITIES

	Equipment
1	100kN MTS Fatigue Test Machine
2	LS Dyna 16 License And ANSYS 2 License
3	Ballistic Impact Test Facility
4	Hail Ice Impact Test Facility

100kN MTS Fatigue Test Machine

SPECIFICATIONS	
Force capacity	100 KN
Available actuator ratings (nominal)	25 KN
Actuator dynamic stroke	100 mm
Max vertical test space standard height	788 mm
Working height	922 mm
Column spacing	533 mm
Column diameter	76.2 mm
Base width	1018 mm
Base depth	698 mm
Diagonal clearance	2079 mm
Overall height	2065 mm
Weight	635 Kg

Lab Facilities



System type	Make & Model	Specification	No. Of. Systems
Workstation	HPZ238	Intel Xeon E3,32GB RAM,1TB HDD,21” LCD Monitor, PS/2Keyboard NVIDIA NVS 315 1 GB Graphics	**1**
Desktop	Acer Veriton	Intel i7,3.0GHz,8 GB RAM,500 GB, PS/2Keyboard ,HDD,18.5” LCD Monitor, NVIDIA NVS 315 1 GB Graphics	**1**
Desktop	HP 280G3	Intel i7,3.0GHz,8 GB RAM,1TB HDD, PS/2Keyboard,18.5” LCD Monitor, NVIDIA NVS 315 1 GB Graphics	**6**
Desktop	HP 6200	Intel i5,3.1 GHz,4GB RAM,500GB HDD, PS/2Keyboard,18.5” LCD Monitor, NVIDIA NVS 315 1 GB Graphics	**2**
Desktop	HP 280 G2	Intel i5,3.1 GHz,8GB RAM,500GB HDD, PS/2Keyboard,18.5” LCD Monitor, NVIDIA NVS 315 1 GB Graphics	**1**
Workstation	HP Z1 Tower G9	Intel Core i7 12th gen processor 12700 64GB RAMDDR5, 512GB SSD, Intel UHD graphics 21.5” Monitor	**2**
Workstation	Inverto i7000	Inverto i7000 ZFL5CKQ9,HDD1-2TB, HDD2-2TB RAM 64X8GB MAC ID	**2**

SOFTWARE

LS Dyna	16 License
ANSYS	2 License
MATLab 2021b	2

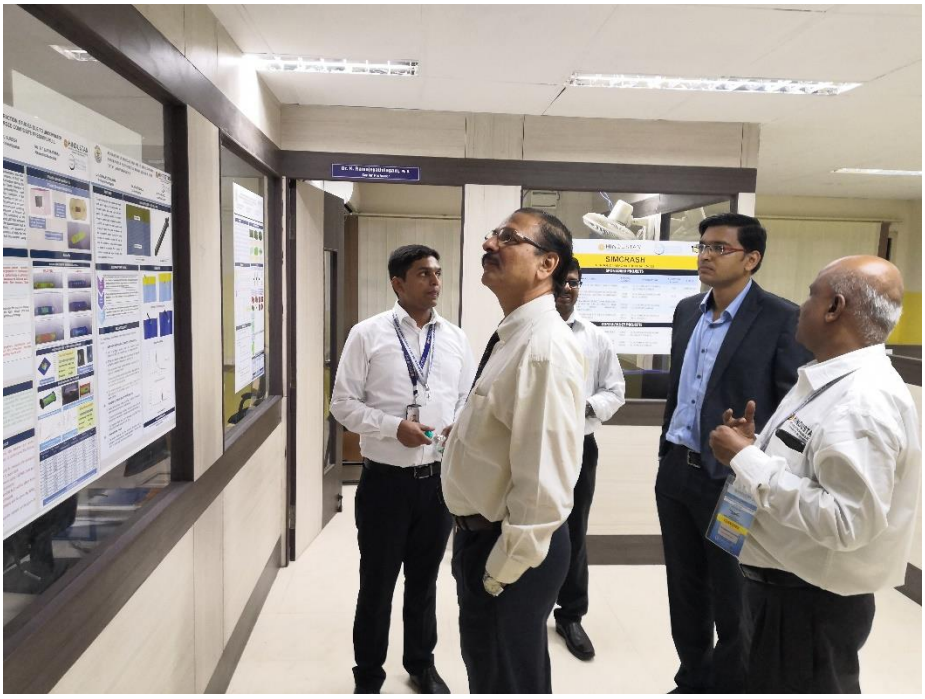
Hail ice impact test facility

S.No	ITEM	SPECIFICATION
1	Caliber	25.4 and 38.1 mm
2	Total mass to be launched	100 grams max (including Sabot and hail)
3	Maximum velocity	300 m/sec
4	Impact point accuracy	± 5 mm
5	Launch tube type	Smooth Bore (unrifled)
6	Maximum pressure desired in the gas reservoir	15 Bar
7	Propelling Gas	Air
8	Pressure Booster Ratio	1:2
9	Test Specimen dimension	300 mm x 300 mm
10	Test chamber	Provision for target mounting, Projectile Stopping mechanism
11	Operational Control	Ball valve (manual)
12	Safety Mechanism	Controls to prevent misfire or an untimed shot(solenoid Switch)
13	Electrical Power	230 V AC
14	Velocity Measurement System (Chronograph)	For measuring the velocity of the projectile at the muzzle end
15	Enclosure	Mild Steel Sheet – Enclosed chamber

Ballistic Impact test facility

S.No	ITEM	SPECIFICATION
1	Caliber	9 mm & 15 mm
2	Total mass to be launched	100 g max. (Including sabot and projectile)
3	Maximum velocity	300 m/sec
4	Impact point accuracy	± 5 mm
5	Launch tube type	Smooth Bore (unrifled)
6	Maximum pressure desired in the gas reservoir	15 Bar
7	Propelling Gas	Air
8	Pressure Booster Ratio	1:2
9	Test Chamber dimensions	600 mm X 750 mm
10	Test chamber	Provision for target mounting, Projectile Stopping mechanism
11	Operational Control	Manual Control
12	Safety Mechanism	Controls to prevent misfire or an untimed shot
13	Electrical Power	220 V AC
14	Velocity Measurement System	For measuring the velocity of the projectile at the muzzle end
15	Enclosure	Mild Steel Sheet – Enclosed chamber
16	Dimension	(1830 X 915 X 915) mm

Eminence visited to SIMCARSH




SIMCRASH